NOV 10 1924

AUTOMOTIVE INDUSTRIES
The AUTOMOBILE

Vol. 51
Number 19

PUBLISHED WEEKLY AT 239 WEST 39th STREET
NEW YORK, NOVEMBER 6, 1924

35c. a copy
$3.00 a year

CHART almost any chapter of mechanical progress. There is a steep, perhaps ruthless, advance toward technical perfection. There is a period of consolidating all experience. And then complete proficiency seeks its most artistic expression. ¶ So the sturdy new small-diameter wood wheels by Motor Wheel, technically perfect, are now the height of fashion on balloon-tired motor cars.

MOTOR WHEEL CORPORATION, *Wood Wheels, Steel Wheels, Stampings,* LANSING, MICHIGAN

Motor Wheel Products

Motor Wheel PRODUCTS

Entered as second-class matter Jan. 2, 1900, at the post office at New York, N. Y., under Act of March 3, 1879

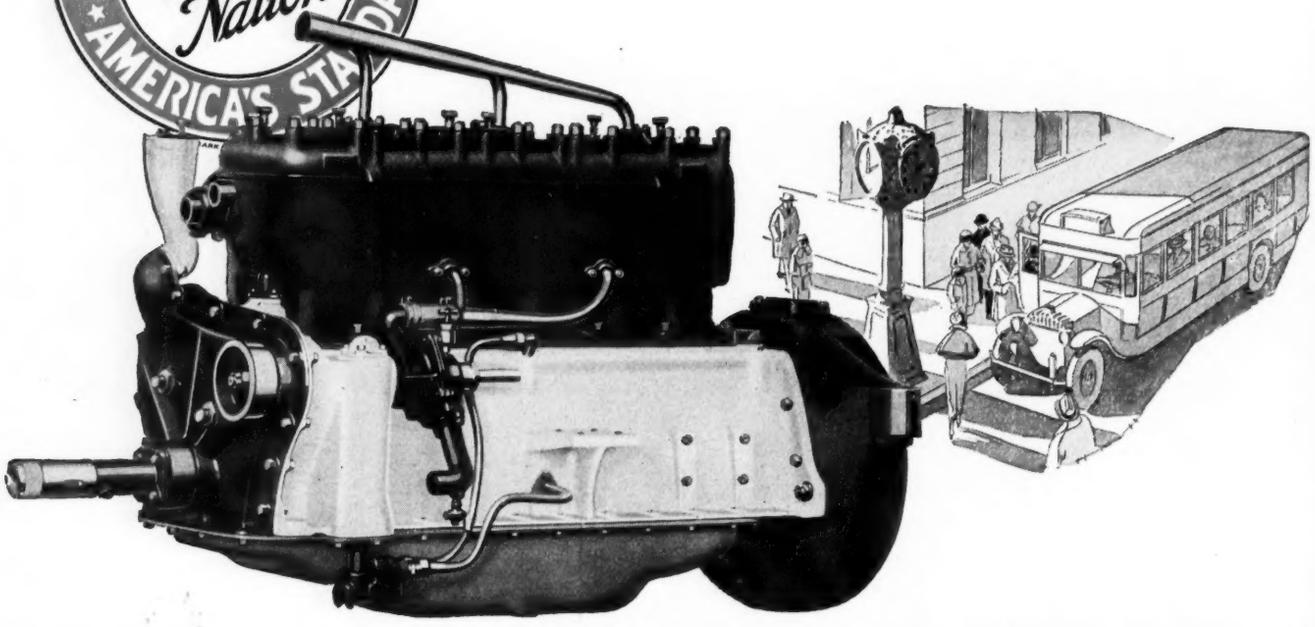
Continental 6-Cylinder Bus Motors make transportation schedules dependable

TO FULFILL the vision of ideal and reliable bus transportation, Continental built 6-Cylinder Bus Motors. And now, through sheer merit, these Bus Motors are in demand wherever constant, durable, dependable service is essential. Modern traffic conditions, accurate schedules, and the enlarged areas bus transportation must cover inevitably require the flexibility, speed and power always recognized in the Red Seal Continental Motor.

The world's largest motor specialists have built four different 6-Cylinder Bus Motors, each to serve a special field—from the twenty-passenger city bus to the spacious double-decker and inter-city coach. These Red Seal Bus Motors are backed by twenty-three years of motor building experience.

The Continental Red Seal—the Symbol of a Master Motor Building Organization

CONTINENTAL MOTORS CORPORATION
Detroit and Muskegon



LARGEST MOTOR SPECIALISTS IN THE WORLD

AUTOMOTIVE INDUSTRIES
The AUTOMOBILE

VOL. 51 NEW YORK—THURSDAY, NOVEMBER 6, 1924 NO. 19

Election's Over! Business is Set for Steady Advance

Retail sales fair in most sections, but used cars are moving slowly. Rural buying improves. Conditions still unsatisfactory in Far West. Raw material price index declines.

By Norman G. Shidle

WELL, it's all over. The election can't be blamed for business ills any longer. The result was a defeat for those forces of the body politic which demanded material changes in the present method of doing things. Business men generally will approve the outcome and will feel that they can go forward with more confidence than they have had in several months.

The automotive industry is in a particularly favorable condition, because its general tone has been improving steadily in recent weeks. With the barrier of election uncertainty swept away its march toward better business should be accelerated considerably. Several distinctly favorable factors appear on the automotive horizon at this time.

Retail stocks of cars are practically back to normal.

At the same time production has held up so well that for the first ten months of this year the total output has fallen behind that of 1923 by less than ten per cent.

Export trade continues brisk. It seems almost certain at this time that 1924 will be the biggest export year in the history of the industry.

Reports from other industries indicate that the automotive trend is a reflection of a general business improvement. Production of most commodities has been on the upgrade for several weeks, progress has been made toward better balanced inventories and retail stocks, and small but consistent gains are predicted for the next few months. Exceptions to the general trend are to be found in the brick, building, cement, oil and lumber fields, but a firm tone is characteristic of most industries at the present time.

Few really unfavorable factors appear to dim the brightness of the whole as regards future automotive prospects. Several factors, which in themselves are quite undesirable, still exist in the industry, but since they are the result rather than the cause of business conditions they cannot be counted heavily in weighing immediate economic trends. Among these unfavorable factors may be listed:

Marketing costs, both wholesale and retail, are high and don't show any signs of coming down.

Dealers in general aren't going to show adequate profits for the year although a good many individual cases may be found in which returns will be very good.

Parts makers have been caught between the rising cost of merchandising replacement equipment and the phantom profit-margin of original equipment sales, so that their balance sheets, in many cases, will not be as favorable as might be desired. Again, however, important exceptions can be found.

October production was very nearly the same as that of September, but much below that of October, 1923. Thus it appears that the output figures are reflecting rather accurately the general retail sales situation.

The price of raw materials consumed by the automotive industry has dropped rather sharply since the first of September after having climbed steadily for the two previous months. While this drop in auto-

motive raw materials was taking place, Bradstreet's curve for raw materials in general went up, indicating that from a buying, as well as a sales standpoint, the automotive industry has been in a favorable position for the last thirty days.

The general business situation as it exists today is well described by the *National Bank of Commerce of Detroit*, which says with admirable brevity:

"Notable among the favorable factors in this review of recent business operations are increasing exports, decreasing business failures, an increase in freight car loadings and a decided gain over the late summer steel and iron output and activities. Probably the most unfavorable element is found in the decrease in railway gross earnings as compared with a year ago, although operating expenses record a still greater decrease, resulting in only a small decline in net operating income."

Telegraphic reports from AUTOMOTIVE INDUSTRIES' correspondents in various parts of the country show that things are going pretty well on the sales firing line. With the election left behind, the industry can look to field reports of actual economic conditions as the chief indication of what the immediate future will bring.

The outstanding facts revealed by this Nov. 1 survey are:

1. Used car sales are slowing up again in many parts of the country.
2. Price reductions to move stocks of old models have become common.
3. New car sales in October generally were equal to or better than those of September, except in the Far West.
4. New car sales in October generally were not up to those of the same month a year ago.

Weighing Business Conditions

Favorable conditions outweigh the unfavorable in the territories adjacent to Seattle, Baltimore, St. Louis, Chicago, Birmingham, Milwaukee, Louisville, Boston, Toledo and Des Moines.

The balance seems to be about even in the Indianapolis area, while things seem to be getting no better in the sections dominated by San Francisco, Los Angeles, Salt Lake City and Kansas City.

The report from Des Moines is specially interesting as containing the first bit of automotive optimism that has come out of the Hawkeye State in many months. Victims of poor crops and political uncertainty, Iowa dealers have not had a good year. Pessimistic reports have been the rule for some time and the current summary includes heavily unfavorable factors, yet a slight note of optimism is struck for the first time. The report from our correspondent runs:

"The excellent weather of the last thirty days has helped to stimulate the automobile business in the State of Iowa. This increased demand has been particularly noticeable in lines selling above $1,800. Most cars in this class sold better than during last month and in many instances equaled the number of units sold during the same month last year. Cars in the lower price field held their own, equaling sales of last month but falling below the sales for October of last year.

"City dealers have enjoyed better business than those dealers serving rural trade. This is partially due to the uncertainty surrounding the outcome of the Iowa corn crop. Crop experts claim that the Iowa production of corn this year will be at least 23 per cent below the total yield for last year.

"Used cars are a drug on the market. Conservative traders find it extremely difficult to persuade owners to accept marketable allowances for used cars. Some dealers, reported to be wild traders, are piling up stocks of used cars. Used car stocks vary greatly, some dealers having large stocks, while the more cautious automotive men are trying to prevent an accumulation which must be carried over the winter months."

Used Car Sales Slow

The growing threat of used car stocks is sounded from many sections, including some in which new car sales are going ahead quite satisfactorily. A few statements from reports tell the story briefly:

Birmingham—"Used car sales are very slow."

St. Louis—"Used cars are suffering their seasonal slump."

Boston—"Used cars have not been moving very fast."

Indianapolis—"The sale of used cars is slower than a year ago."

Berkeley—"The used car market is glutted."

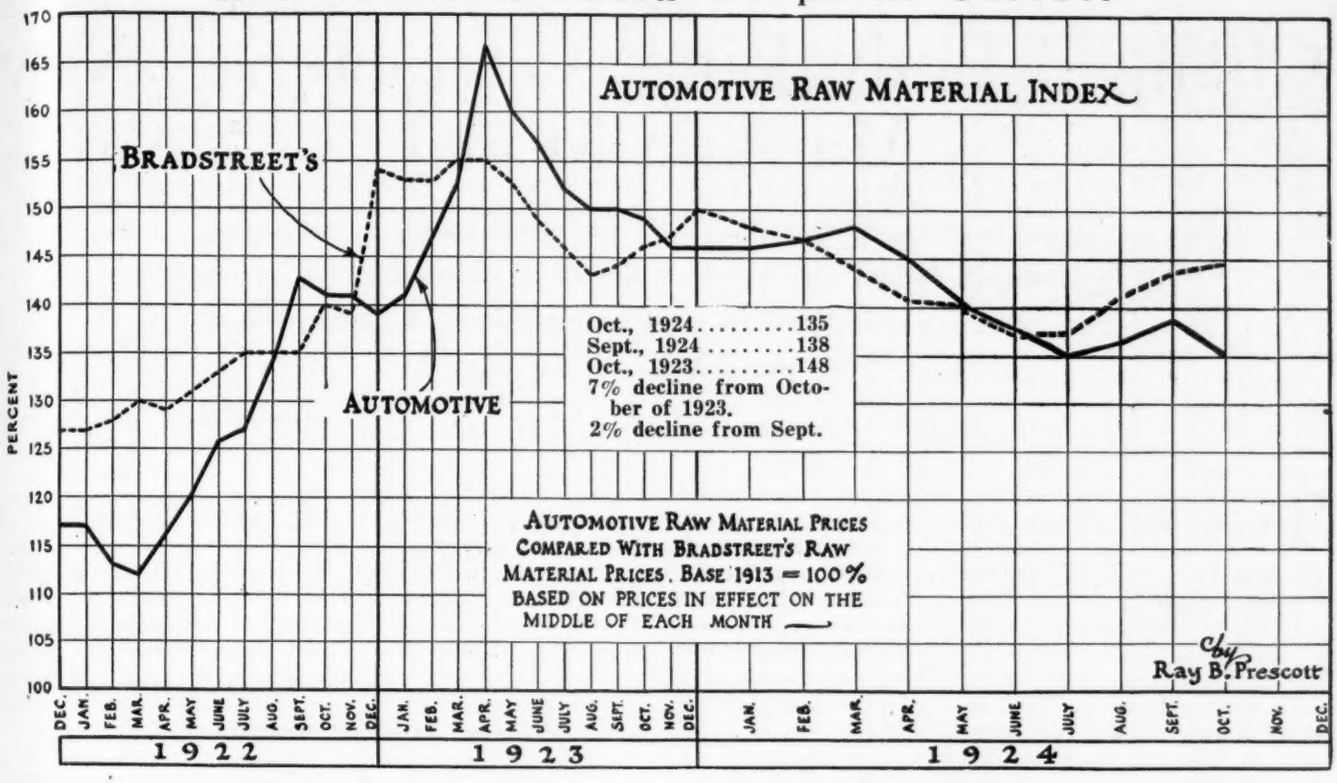
Salt Lake City—"The used car situation is far from bright, but not yet alarming."

These statements are typical of a majority, yet better conditions do prevail in certain areas, as is shown by the survey from Baltimore, which says that both new and used car stocks are in good shape; from Chicago, where "the stock of used cars is about the same as last year," and from Milwaukee, where "used car sales in October are reported considerably in excess of the same month last year, but prices are much lower, so that a dealer has to do a much larger business in volume to get the same dollar returns."

What would compulsory insurance do to used car sales? This is an interesting question that has passed the academic stage in California. It is said that fear of compulsory insurance in that state is deterring sales of both new and used vehicles. Used car dealers are looking askance at the compulsory insurance act which is being proposed in California, although little general publicity has been given to the question up to the present time. A general feeling exists that the passage of such a bill would seriously curtail purchase of used cars selling for $100 to $300.

Price reductions have increased sales on the Pacific Coast of those cars making the cuts, but has reacted unfavorably on other makes. "It has injected into

Raw Material Index Drops in October



the public mind," our correspondent states, "the idea that other automobiles should be reduced in price as well."

From many sections comes the encouraging news that, despite heavy stocks of used cars, dealers are exercising more care in buying than ever before; that a large percentage of them are refraining from the wild trading which characterized the retail situation several months ago. While this general trend does not hold true in many places, it does constitute a favorable aspect of the present situation.

Increased demand for closed cars is growing up in many sections, and there is every evidence that the tendency, common for several years past, to use more closed jobs is continuing at an increasing rate.

Farm business seems to be improving. Evidences of this are to be found in reports such as the following:

Indiana—"The industrial centers of the State still suffer with slow sales, while the rural sections have picked up and give good promise of steady business."

Alabama—"Dealers insist that trade prospects are getting better. The increase in sales, they believe, will come from the farmers in the Birmingham district, who are fairly prosperous and whose crops are diversified."

Kentucky—"Distributors report that their rural dealers are disposing of more cars than in the past."

California—"Rural sales of new cars are more encouraging," says a Berkeley report, while Los Angeles survey says, "Demand in rural communities has shown a much larger reduction than in the metropolitan district."

Maryland—"Many sales are being made in the rural districts. The demand in these sections has shown considerable improvement of late, because the farmers have made more money this year than for some time. They are expected to continue buying."

In those territories where business still is rather slow little improvement seems to be expected between now and the end of the year. Almost universal belief exists, however, that 1925 will be a year of good business for the automobile trade. Boston dealers expect increased sales now that the election is over, as do the retailers in Baltimore.

The soft spots in the automobile retail situation are so widely scattered that no definite section can be said to have all of the favorable or all of the unfavorable aspects. The Far West, it is true, still seems to be having more than its share of trouble, but conditions seem to vary. In some cases the current situation is difficult to account for. In Kansas City, for example, new car sales are reported to have dropped in October about 40 per cent below the September level. Dealers in that territory, while unable to account for this radical drop, feel that it is only temporary.

From a manufacturers' standpoint the industry is on a sounder basis than it ever has been before, because a different psychology exists. There is a tendency to look to the future confidently but conservatively, to look before leaping, and to build production schedules on the basis of actual retail data. The parts makers are having a fairly hard time of it, but some are making good profits, while the condition of dealers is improving slowly but steadily.

Changed Body Lines Characterize New Marmon Model

Engine has integral inlet manifold. Control members have been rearranged, solid propeller shaft has been adopted and steering gear has been redesigned to meet requirements of balloon tires. Wire wheels and four-wheel brakes to be supplied at extra cost.

By B. M. Ikert

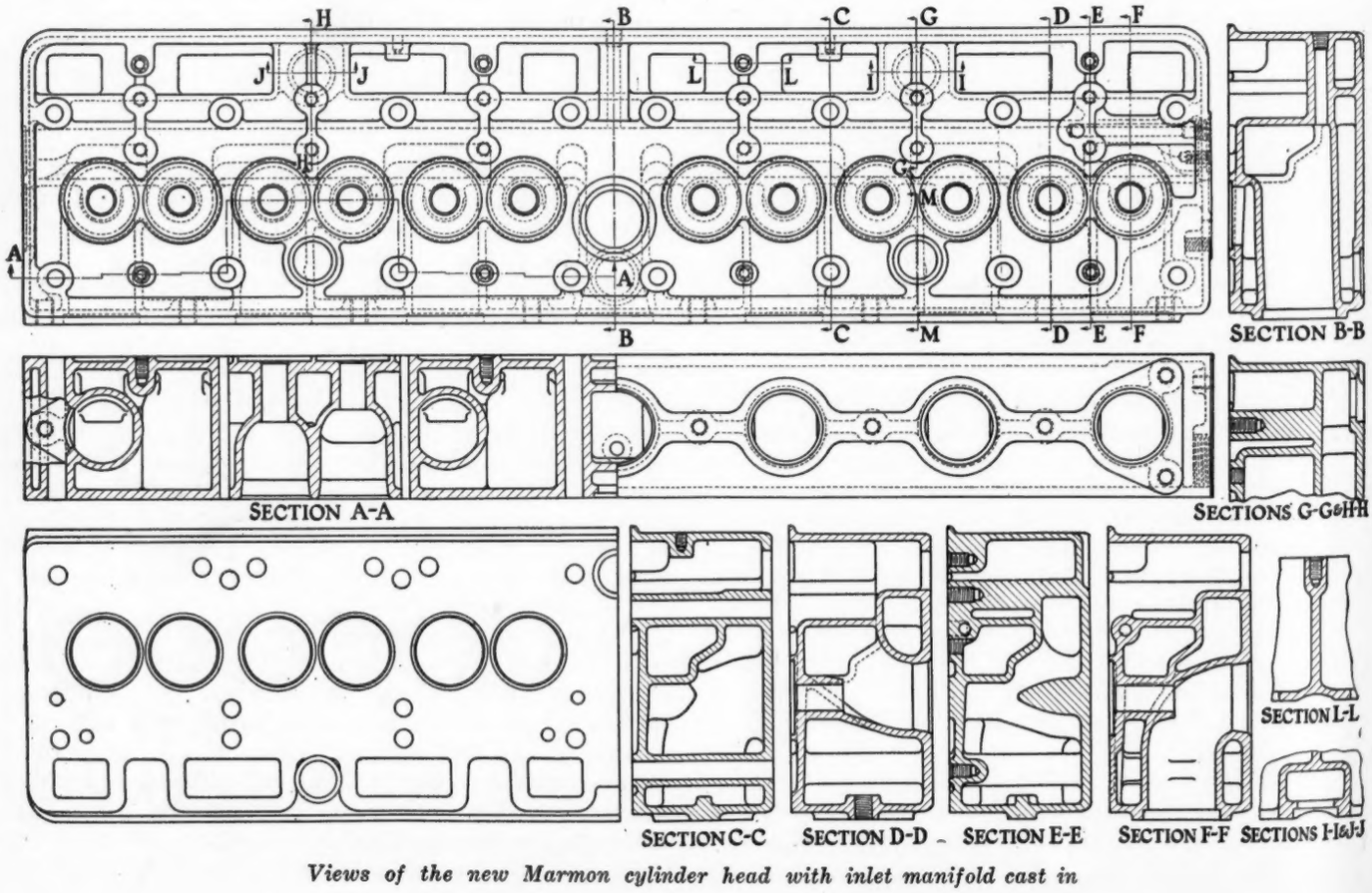
THE characteristic features which were first incorporated in the model brought out in 1916 by the Nordyke & Marmon Co., are continued in the new Marmon 74. Some refinements have been made in the chassis, but the greatest changes are in the bodies. The adoption of Duco as a standard finish for all models, double molding at the belt line, wider and roomier bodies and built-in sun visors characterize the new models.

There are many novel features on the new bodies, such as a three-way lamp, comprising a tail-light, stoplight and backing light; a double tire carrier on the rear with adjustable clamp and Yale lock; individual type head and cowl lamps, which incorporate the pyramid feature of the Marmon radiator design; dimmer switch on the toeboard, all-wood steering wheel, silver-plated reflectors in lamps, satin silver mat background instrument board equipment, a new type carbureter adjustment, combined cigar and handy lamp on instrument board, and vanity and smoking sets in the DeLuxe models.

Standard equipment on all models includes a rear view mirror, five demountable rims, complete set of tools and two Prest-Air power bottles for tire inflation. Wood wheels are standard equipment, but wire wheels can be supplied for $100 extra. Front wheel brakes also can be supplied for $100 extra. Windshields on closed models are of the one-piece, and on open models of the two-piece type.

The accelerator pedal has been moved to the right of the brake pedal. The gasoline tank (of 19 gal. capacity) is now located at the rear of the frame, replacing the former cowl tank. This change, of course, has necessitated adoption of the Stewart vacuum tank. The open models are fitted with 6.20 x 20 in. balloon tires, while the closed models are fitted with 7.30 by 20 in. tires.

Quantity production is said to be the reason that makes



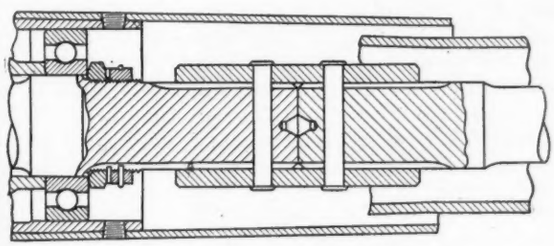
Views of the new Marmon cylinder head with inlet manifold cast in

it possible to sell the sedan at only $130 more than the open cars. It has four doors and seats five passengers. This model is finished in Duco two-tone gray and upholstered in Laidlaw broadcloth. The four-door brougham coupe is quite similar to the sedan in design, but has a deck at the rear. The rear quarter and rear end are finished in leather, with metal arms, giving the Landau effect. This model is finished the same as the sedan. The windshield of the DeLuxe models is of the slanting type, with a visor which is a continuation of the top. This windshield construction is said to be expensive, but it affords maximum vision for the driver.

Coupe DeLuxe a Two-Passenger Car

The coupe DeLuxe, a two-passenger car, is finished in a two tone green gray. The seat extends straight across, and there is a large compartment in the rear of the seat back, with another luggage compartment in the rear deck. There is also a compartment for golf bags in the rear deck, to which access may be had through the large door at the right side.

The seven-passenger sedan DeLuxe is finished in two standard colors, gray and black, and blue and black. The auxiliary seats of this model are arranged in a novel manner, the passenger in the left seat facing to the right



Splined joint between propeller shaft and bevel pinion shaft

and the passenger in the right seat to the rear. It is held that this is a natural and sociable arrangement. Reading lamps in the rear quarters and dome lamps which also illuminate the running boards are features of this model. The seven-passenger sedan limousine DeLuxe also is finished in the same two standard colors. A partitioned glass controlled by hand lever separates the front and rear compartments. This model is completely equipped as to reading lights, smoking sets, etc.

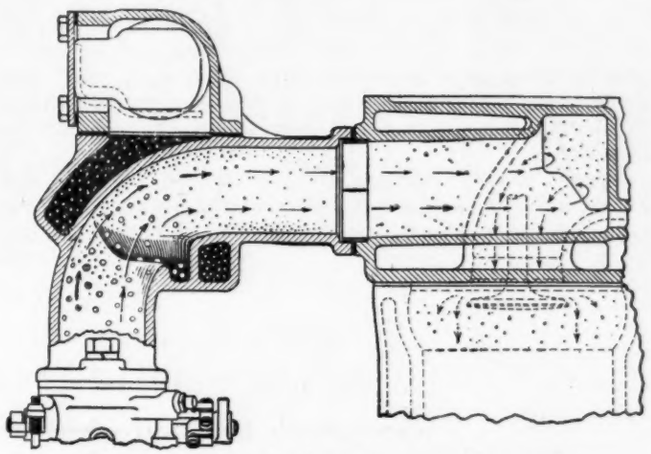
The five-passenger sedan DeLuxe is finished in two-tone gray and also in green gray and black. Upholstery is in broadcloth (which is used in all of the closed models).

The five-passenger sedan limousine DeLuxe is upholstered in genuine leather in the front compartment and broadcloth in the rear compartment. Buckingham gray and black and Duco green and black are the two standard finishes.

Roadster Finished in Two-Tone Green Gray

In the open models the roadster is finished in two-tone green gray, upholstered in genuine leather, and has a rumble seat in the rear deck. There is also a golf bag compartment, and a storage compartment back of the rear seat. The top is folding, as on all Marmon 74 open models. The five-passenger phaeton is finished in two-tone gray and blue and black, while the touring car is finished in Duco gray and black, blue and black and green and black.

Quite a change has been made with respect to the intake manifold, which is now cored in the cylinder head casting. An aluminum elbow fitting against the cylinder head carries the carbureter. It has a jacket at the top which communicates at the top with the passage through



Section through aluminum L connecting carbureter to cylinder head, showing exhaust jacket and pocket in which unvaporized particles of fuel are caught and subjected to exhaust heat

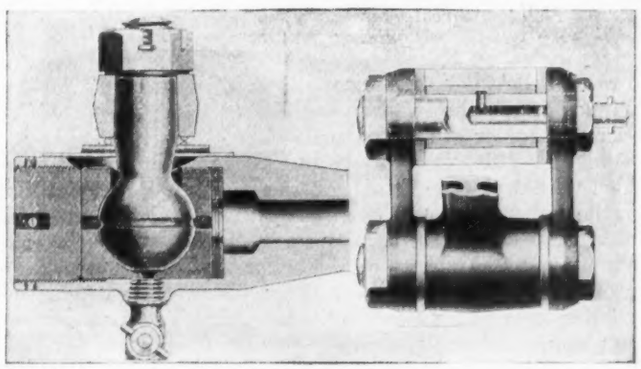
the exhaust manifold. A pocket at the side of the intake passage in the hot elbow serves to trap any liquid fuel which may run down the walls. By means of an easily accessible valve this device can be shut off in summer.

Slightly heavier stock is used in the frame of the new car. This change was made to permit of a different construction at the joints of the cross members near the middle of the frame, whereby the rivet heads, which formerly were exposed to view on that part of the frame which corresponds to the ordinary running board splasher, are eliminated. A slight change has been made also in the frame as regards the fastening of the rear fender. Formerly the running board was curved at the rear to meet the fender, while now it joins same at a sharp angle, a triangular bracket being placed at the rear of the running board and the fender attached to it.

A ball and socket type tie-rod is now used in the steering gear, with means for positive adjustment for wheel toe-in, in the form of shims behind the inner ball seat. While the steering gear is of the same design as formerly, it has been adapted to meet the requirements of balloon tires. About 2½ turns of the steering wheel are required to bring the wheels from extreme left to extreme right, corresponding to a ratio of about 14 to 1.

Renewable bronze washers are provided on both sides of the spring shackle, between the bracket or spring eye and the shackle strap. The shackle bolt is screwed into the strap at one end and provided with a locknut. By turning the bolt the end play may be taken up and in case of extreme wear the bronze washers may be replaced. The bronze washers also serve to retain the lubricant.

A solid propeller shaft has been substituted for the



Left—New design of drag link connector.
Right—Details of new spring shackle

former tubular one, and the drive pinion shaft is connected to the solid shaft by means of a splined sleeve which, after it is fitted over both the pinion shaft and driveshaft, is pinned in place. The speedometer shaft is driven through a worm and gear inside the gearcase at the rear.

Formerly the carbureter was controlled through pull wires by two knobs on the instrument board. This arrangement has been replaced by a rod which extends from the carbureter to the instrument board and there carries a lever capable of moving over a dial. There are three positions for this lever—choke, warm-up and run.

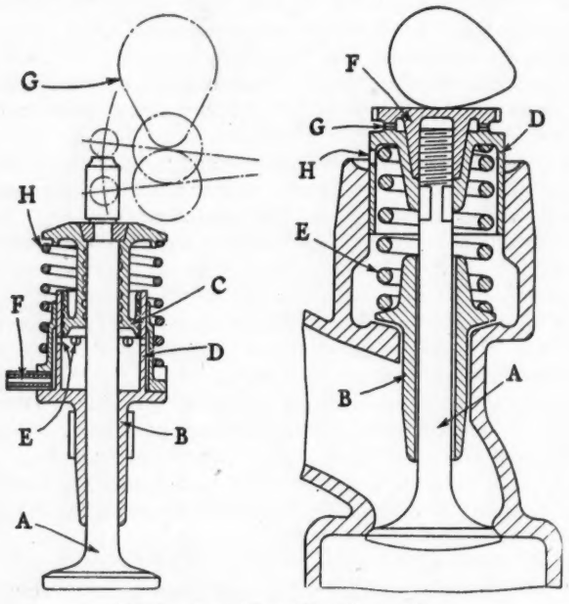
The removal of the accelerator pedal from between the clutch and brake pedals to a position to the right of the brake pedal, has necessitated a slight offset in the gear shifting lever in order to provide ample leg room.

A particular study has been made of back cushion contours, and the new design is said to contribute greatly to the comfort of occupants. A comparison of this contour with the more usual one is made in the illustration.

Patents Issued on Two New Valve Constructions

THE desire for utmost simplicity and low weight in aircraft engines brought us the design in which the cams act directly on the valves, without intervening levers or push rods. It is quite evident that in such a construction the friction between the cam and cam follower results in considerable side thrust on the valve, which must be taken up at the bearing surface of the valve stem guide, and if this is of small diameter and the valve stem overhangs it a considerable distance, rapid wear of the guide may be expected.

Two patents have been issued in England recently in which the patentees provide increased bearing surface close to the line of contact between cam and valve. The Société Louis Breguet of Paris, one of the two referred to, in addition provides an air cushion which helps the spring



Breguet valve with air cushion
Newton direct-operated valve with enlarged guiding surface

to return the valve to its seat. The initial pressure in the cylinder of the shock absorbing device is kept constant by a compressor or other means.

Valve A slides in guide B and at its upper part is provided with a piston C which works in a cylinder D formed by the upper part of the guide B. A series of ports or holes are provided at the upper center of the piston, which communicate with the tube F leading to a small compressor or other source of compressed air. The pressure in the cylinder is regulated to obtain the necessary pressure on the piston to return the valve.

The valve is worked by the cam G in the usual manner and it is claimed that the invention permits of using a very light return spring H or of dispensing with it entirely. By modifying the position of the ports E the pressure on the cam may be varied. Thus the cam profile may be so designed as to provide the maximum area of opening of the valve with a minimum acceleration, which is constantly equal to that produced by the compressed air.

The other patent referred to was issued to R. B. Newton of Manchester, and in this case, too, the provision of the extra bearing surface for the valve guide is incidental, the real object of the invention being to provide adjusting means for the valve.

Valve A is provided with a bottom bush B which fits within the valve casing C. At the top of the valve a portion of the stem is squared and carries the piston-like guide D. The valve spring E takes up its position between bush B and guide D. The center of the guide is conical and is made to coincide with a coned nut F, which is carried on the threaded end of the valve stem. On the under face of the nut and also on the upper face of the guide V-shaped teeth G are formed. The rim of the nut is notched to take a key, and a small hole H is drilled in the side of the guide so that it can be held while the nut F is turned. When the clearance between the valve and its operating cam needs to be reduced or increased, the necessary adjustment can be effected by merely partially rotating nut F. The tension of the spring and the V-teeth serve to hold the nut locked after the adjustment has been made.

Standardized Starting Cranks

SOMEONE has suggested to the S.A.E. Standards Committee that starting cranks should be standardized, so that if a motorist while on tour should find that his self-starter did not work and he had left his starting crank behind, he could get a duplicate of the latter at any automobile supply store.

The idea seems to be an excellent one and quite practicable. If followed out it would certainly eliminate one form of "grief" in the use of motor cars. At the present time, when hand cranks are so rarely used, it is a very common thing for careless drivers to leave this part of the equipment behind, greatly to their regret if their battery runs low or something else occurs to make the electric starter inoperative.

If the suggestion should be taken up and a standard design for a starting crank worked out, an item could be included in the specifications which requires the hardening of the jaws. The jaws of the cranks furnished with some of the cheaper cars at least are now made of very soft steel and left unhardened, and as the points of the jaws on the starting crank and the crankshaft, respectively, often knock together while the starting crank is being disengaged, these points are easily bent back, making the starting crank unserviceable and even dangerous.

Front Brakes and Balloon Tires Chief Novelties at Olympia Show

Only a few servo-mechanisms were in evidence. Fabric bodies and others with steel frames have increased in popularity. Drop base rims made their appearance again.

By M. W. Bourdon

IT would be incorrect to say that the recent Olympia Show indicated a stagnation in design, but there appeared to be no new tendencies of a fundamental character, apart from the adoption of front-wheel brakes and balloon tires.

Doubts which existed at this time last year with regard to four-wheel braking practically have been forgotten. It is clear that the majority of British makers have reconciled themselves to the apparent need for fitting front brakes, for they are either standard equipment or an optional extra on 57 per cent of models, and 80 per cent of models over 120 cu. in. size.

There is considerable divergence in the extra price charged for front brakes when they are optional. The Standard Co. asks £10 extra for Perrot type brakes and Morris offers an allowance of £10 if rear-wheel brakes alone are accepted. On the other hand, Humber and Armstrong-Siddeley, also for a Perrot equipment, respectively charge £30 and £35 extra. The average is approximately £20.

Napier will not fit four-wheel brakes even at extra cost on his 40-50-hp. six with a chassis price of £1,500; nor will Rolls Royce on the 20-hp. model. At the other end of the scale is the 7-hp. Austin, which has them as standard equipment, as well as the Austin twelves and twenties.

Brake Changes Common

Striking differences of design and actuation methods are to be noted. Of the makers offering front brakes, 33 per cent have their own exclusive designs; 18 makers are using the Perrot type, and 14 makers are using the Rubury pattern. Horstman and Triumph have adopted the Lockheed system and are the only makers using contracting band brakes on four wheels. No maker except Rolls Royce is using a servo device except for the Perrot automatic servo shoes.

In the Rolls Royce the servo comprises a form of single plate clutch on the transmission shaft, which is brought into operation when one set of rear brakes is applied by pedal. The servo alone applies the front brakes, but supplements the pedal pressure to the rear ones; thus front braking effort is always less than that at the rear.

The Austin seven and one other make have the front and rear sets of brakes independently applied by hand and pedal respectively. Rover applies all four sets both by hand and pedal, or by either, having only the four sets of shoes—one in each wheel drum. An overrunning link prevents the hand lever from moving when the pedal alone is used.

Lanchester, in his 40-hp. model, is the only prominent maker who has adopted a tubular front axle when using front brakes. The majority of makers have not made any change in front axle design for front brakes beyond stiffening the previously used H-section.

Front springs of the 40-hp. Rolls Royce are shackled at the front ends now that four-wheel braking is to be standard equipment. The brake operating shafts are carried below the axle beam and are coupled to the camshaft at the top by means of levers and light pull-rods with ball joints. Cables run from a swinging link in line with the rear end of the spring to levers on the operating shaft. Thus spring deflection does not affect braking appreciably, for the springs are practically flat when loaded and have no great amplitude of movement.

Small Cars Use Four-Wheel Brakes

Front brakes are being applied to a few small cars with quarter-elliptic springs, but an extra leaf usually is fitted.

Balloon tires have come on with a rush during the past twelve months. No car maker offered them at the 1923 Olympia show, but for 1925 they appear as standard or optional equipment on 41 per cent of all models. Shimmy has caused trouble in a few cases where front brakes and balloon tires have been fitted in conjunction. On the comparatively few smaller cars which have center-point steering and front brakes, shimmy does not appear to have been troublesome.

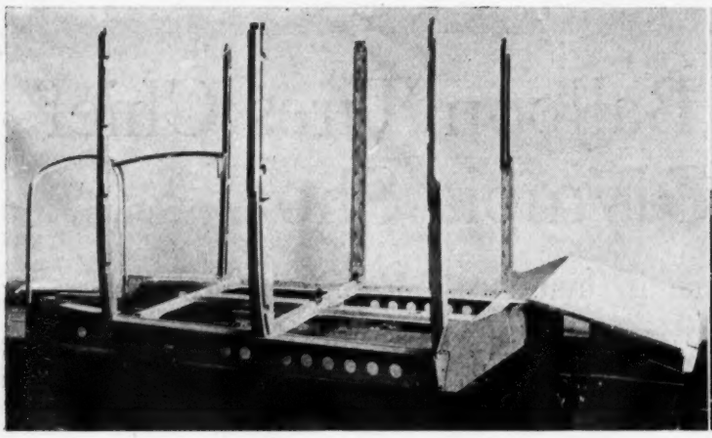
Poppe, designer of the new 14-45-hp. Rover—which has front brakes and balloon tires as standard—claims to have prevented shimmy, even at tire pressures as low as 20 lb. per sq. in., by his rigid mounting of the steering box, holding that this defect is encouraged to occur by lack of a rigid mounting as much as by anything else not a glaringly obvious cause, though clearly there are a great many other points at which such encouragement can arise.

No British maker yet has thought fit to vary the steering gear ratio to give more leverage when balloon tires are provided, but these tires are not standard on the larger cars, while the majority of smaller cars already had more steering leverage than was necessary with high-pressure tires.

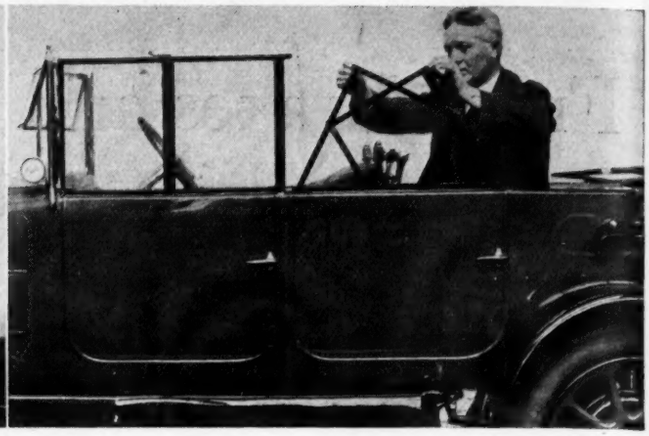
Ball and Roller Thrusts on Steering Pivots

Ball or roller thrusts for steering pivots, however, have been fitted in some cases to 1925 models in place of plain thrusts. In the new front axle of the Lea-Francis, a small car with an engine of 75 cu. in., a single steel ball of ½-in. diameter, located at the lower end of the swivel pin with an adjustable cup screwing upward into the stub axle jaw, supports the load.

Although five new sixes have been introduced, the



Austin steel frame body work in second stage of assembly



Humber side screens in process of erection

total number and percentage has not increased. The vast majority of British car buyers do not want sixes and the market for them in the smaller sizes (up to, say, 180-200 cu. in.) is relatively small.

There are now three British eight-in-line engines; two new examples are introduced by a new firm which put forward one last year and the other by the Belsize Co., one of the oldest firms in the industry.

Belsize Eight-in-Line

The Belsize eight has a five-bearing crankshaft made in two sections, flanged-jointed at the center, with an intermediate unit on which are cut the teeth of the distribution chain gear and at each side of which are formed the halves of a divided central journal. The chain gear drives to the center of the six-bearing overhead camshaft. The bore and stroke are the same as the Belsize four and six-cylinder models (63 x 100 mm.) and many parts are alike in all models, the cylinder blocks of the four being used for the eight, for example.

No British maker of fours, except Vauxhall on the 23-60-hp. model, has adopted the Lanchester Harmonic Balancer. Vauxhall now is fitting bob-weights to the big-end caps of the smallest four (140 cu. in.) with the object of counter-weighting the duralumin connecting rods and bringing the center of gravity approximately in line with the axis of the crankshaft.

Star cars, among the first to have light alloy connecting rods, now have duralumin camshaft gears, built up on a steel center. Vibration dampers on the Lanchester principle for sixes are used more widely, but only one make besides Daimler and Lanchester uses the original, an alternative arrangement consisting of a small flywheel frictionally mounted on the front extension of the crankshaft.

For the first time two makes of overhead camshaft engines (Rover and Aster) are found with stuffing boxes for the valve stems, the object being, of course, to prevent oil from the camshaft, etc., being drawn down the inlet valve stems. The device in each case calls for no alteration in design, merely the addition of an inverted and spring-loaded thimble containing felt washers.

On the Aster 175-cu. in. six, which has pushrods and overhead valves, a new shape of combustion chamber has been adopted, mainly with a view to increasing turbulence. The accompanying section shows the design, which provides a pocket under the inlet valve with the spark plug projecting into it horizontally. The arrows indicate the swirling action which the design is claimed to give to the compressed gases.

One or two makers are using induction manifolds of square section, with the stated object of discouraging accumulations of condensed fuel; Triumph in a new model goes further and continues the square manifold some 3 in. to dead-ends, with advantage, it is claimed, in a buffer effect for the mixture which discourages deposition of liquid fuel.

Several unorthodox features appear in a new Beardmore chassis. It supplements an overhead camshaft model, standard since 1920, but a return is made to the L-head type. The cylinder block, crankcase and the jacket of the detachable head are of aluminum, with cast-iron liners and cast-in valve seats and combustion heads. It is claimed that a weight reduction of approximately 120 lb. is effected. The engine has four cylinders 75 x 130 mm. (2.95 x 5.1 in.). The top of the cylinder head has an aluminum cover plate, giving the impression that overhead valves are fitted.

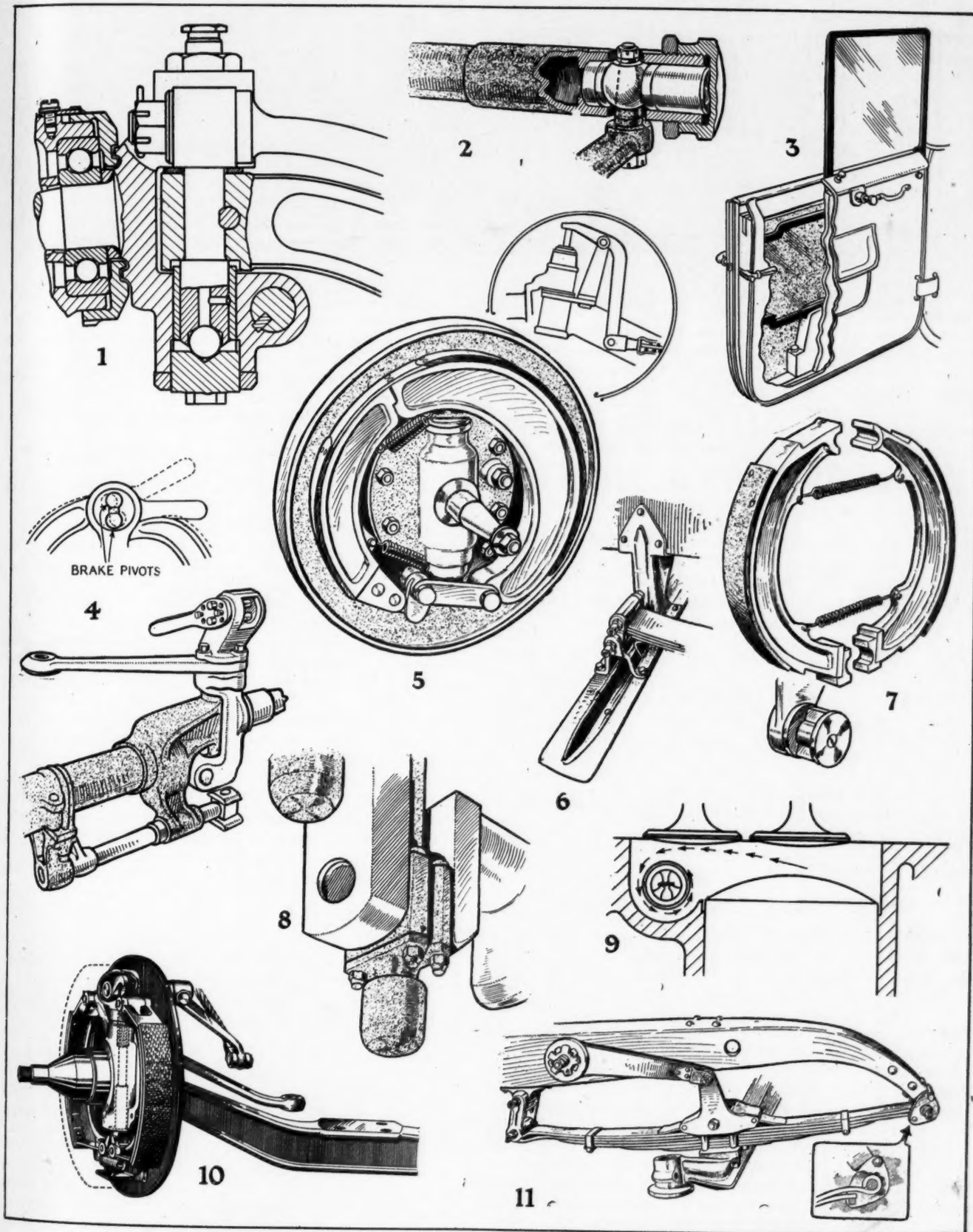
Warm air is drawn down through the cylinder block from the inclosed space to the carbureter. Two cross-shafts are driven from the camshaft, the one at the rear serving for generator and water pump, while the other drives the magneto and an air pump. The latter serves for the pressure fuel feed and also for tire inflation. A feature novel to British practice is an exhaust heated hot-air supply controlled from the driving seat. Tension of the camshaft chain is adjusted by an eccentrically mounted idler sprocket.

Novel Front Springs on Beardmore

Instead of channel section cross members, the frame is braced by three flanged members with V-section reinforcements. These pass across the frame side rails, are attached by pressed steel brackets, and have extensions supporting the running boards. The rear one also supports the front end spring brackets outside the frame. A special type of half-elliptic spring is used to take torque reaction from the Perrot type four-wheel brakes. The second leaf is continued forward until it bears on a square pin within the front-end bracket, while at the rear it passes around the main spring eye. Frictional spring checks are fitted, with a bearing above the center of the springs on a short inverted leaf forming a buffer for the swiveling bracket, an arrangement which is claimed to assist the springs still further in resisting brake torque reaction.

There is no important change in the general trend of chassis design. Unit powerplants are increasing; four-speeds and side change hold their own. There is no further increase in aluminum axles; wire wheels

Changes in British Design Details



1—Lea-Frances steering knuckle with single ball thrust. 2—Vauxhall steering joint has no buffer springs. 3—Humber door into which side screens fold. 4—Lanchester front brake adjustment. Shoes pivot on eccentrically mounted pins. 5—Alvis front brake with servo shoes. 6—Frame cross member on Beardmore. 7—Calcott aluminum brake shoes. Loose plates contact with cam. 8—Bob weights on Vauxhall big end caps. 9—Aster combustion chamber designed to give turbulence. 10—Austin front brake. Wedges expand shoes. 11—Beardmore front spring designed to take front brake torque

show a slight increase; beaded edge tires prevail, except for the large number of Dunlop balloons with drop base rims and wired-edge covers; magneto ignition is again on approximately 90 per cent of cars, for while one or two new cars have battery ignition, it is displaced by a magneto on some continued models.

As regards bodywork several trends are to be noted. In the first place there is a general widening of doors, and in many cases this has resulted in the elimination of the panel between front and rear entrances. Doorways 24 in. wide are found on quite small cars, while there are examples considerably wider. This applies to open cars. On sedans, coupes, etc., doors are wider still.

Adjustable Seats on Cars of All Sizes

To a certain extent this may be attributed to another tendency, one which has been pending for some years but has now become very evident, namely, the provision of adjustable front seats on cars of all sizes. Only in a few cases are separate seats used on open bodies, the general arrangement being a single-unit two-passenger seat, movable fore and aft, and held in position by dowels or studs, either in the body sides or floor. In two of the new Wolseley bodies, in the Beardmore and one or two other cases the angle of the whole seat can also be adjusted, giving choice of passenger attitude ranging from a decidedly upright position to a semi-reclining posture.

Pneumatic upholstery is at present standard equipment on three makes only, Lagonda continuing to use it for the third year; but it is still under test by several other firms with a view to its adoption later. Lagonda also is continuing the all-metal body construction as a unit with the chassis,* but Austin is the only additional maker to depart from orthodox systems apart from fabric sedans.

On the Austin twelves and twenties all types of bodies now have metal foundation and pillars, the former being constructed of sheet-metal side plates, forming girders with a narrow flange, united by channel section transverse and longitudinal members. To this base are riveted pillars of T and L sections, with wood fillings to which the paneling is attached. The resulting body is claimed to be lighter, more rigid and free from risk of creaks developing, and also a cheaper and better manufacturing job.

Vauxhall Uses Flexible Body Mounting

Vauxhall has adopted a flexible body mounting, the body resting on rubber blocks and being separate from the dash, while the latter is permitted freedom of movement relative to the engine hood.

No fabric-paneled open cars have yet appeared as standard types, but there are more car makers and coach builders with licenses to make Weymann sedans. The latter are becoming popular for cars of all sizes, but there are wide variations in the price differences between Weymann and orthodox sedans and between open bodies and Weymann types.

Daimlers supply Weymann sedans for a mere £10 above the price of the open car—even on 30-hp. chassis—while at the other extreme are makers who ask £100 more. And so with makers who are standardizing both types of sedan; in some cases there is very little price difference, in others it amounts to £100.

British renderings of the Weymann system are all less angular than the original, and there is not a strict adherence to the Weymann idea of eliminating metal panels everywhere. They are used for rear quarters and roof edges, in some cases also for wheel-arches and rear panels. Wolseley, in standardizing a light sedan for two models, has departed from the Weymann idea entirely, so far as it concerns the use of air-gap joints in the framing; the Wolseley fabric body is merely a light but moderately rigid wooden framing with the flexible panels attached.

Despite the inherent suitability of fabric sedans for low-powered chassis, not all by any means of the additional car makers supplying closed bodywork on models of 8 to 12 hp. have departed from the orthodox construction. Singer found a good demand in 1924 for the 10-hp. Weymann sedan even on the superseded 67 cu. in. chassis, but this maker is supplementing it with a metal paneled model.

Sliding as distinct from drop windows are used for many of the small and lower-priced sedans. When only two doors are provided one generally is at the left at the front and the other on the right at the rear, a folding and tip-up seat being fitted on the left of the driver. Leather upholstery is being increasingly used instead of cloth in sedans of all sizes and prices.

Draught-Proof Tops and Side Screens

Several makers offer folding top equipments that are almost draught-proof. In the new Humber arrangement, which is not exclusive to this firm, the side screens pivot down into the hollow doors and rear panels of the body, out of sight and yet available for use in a few seconds without disturbing any occupant. The units are in pairs, and one or both sections can be raised or lowered, thus affording adjustable ventilation. As is the case with many makes of detachable side panels, the celluloid is set in narrow metal frames, more sightly than the fabric covered framing of last year and giving clear vision.

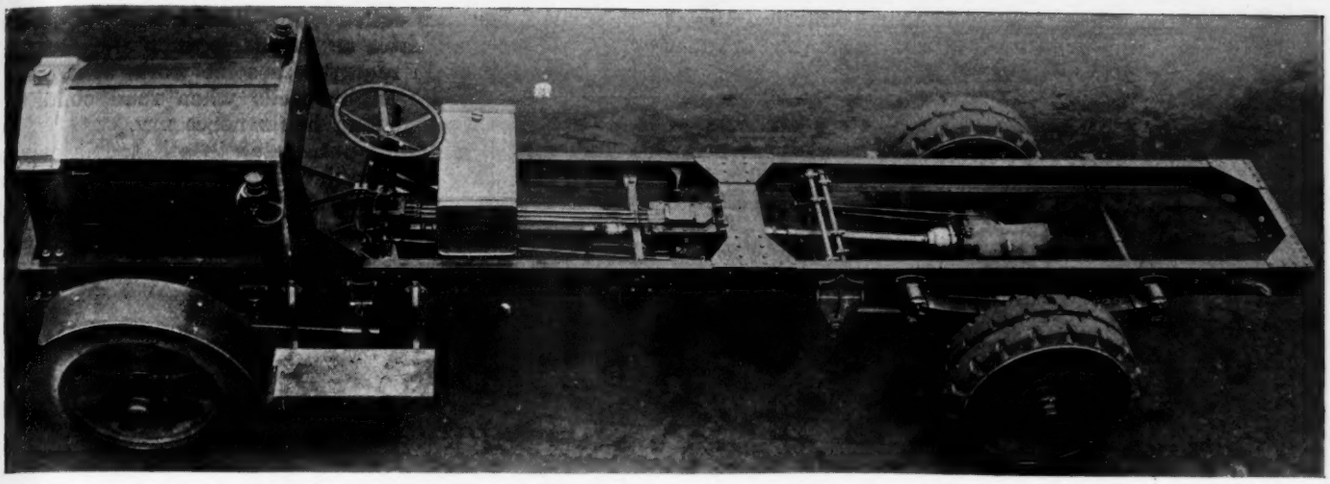
Black folding tops are not altogether popular; the khaki fabric is still widely used; black leatherette is being displaced by black mohair and even the latter shows signs of being displaced in turn and a reversion may occur to lighter colored twills.

No maker yet has adopted any new form of finish as standard, though tests are proceeding in one or two directions.

*Described in AUTOMOTIVE INDUSTRIES, of July 12, 1923.

The "Shop That Used to Be"

THE "shop" that used to be the stable conversation of engineers a score of years ago, is far less common than it was; it has been replaced by problems of production, organization and finance. The standard requirement in the past was a man who knew all about engineering and a little about commerce. Now the position is reversed, and the engineer most likely to enjoy a lucrative position is one who knows all about buying and selling and can reduce engineering to a self-acting manufacturing system. Whether the curricula of our technical schools will have to be modified to suit these new demands, or whether as a whole it can be shown that a liberal education in the science and technology of engineering makes the men best adapted for the requirements of industry, remains to be seen. We must notice, however, a marked tendency to place highly trained men in the sales branch, while leaving the production side to men with less technical, but more organizing ability.—*The Engineer.*



Showing the Rehberger five-ton truck chassis. To reduce maintenance costs standard and interchangeable parts are used on all models wherever possible

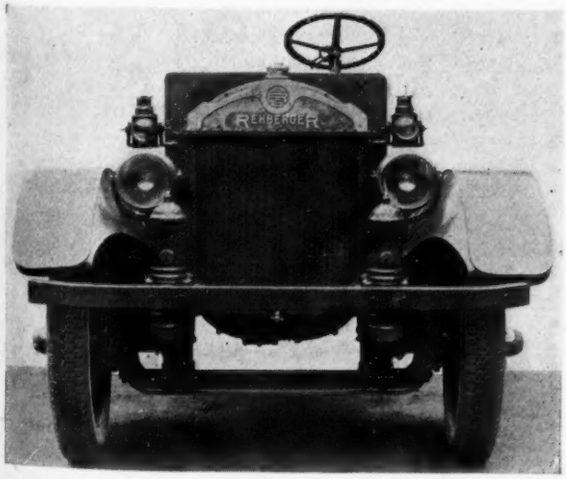
Wheelbase of New Truck Can Be Varied to Meet Service Requirements

Distinctive appearance, durability and minimum service costs are other features of the three, four and five-ton truck chassis which Rehberger & Son are building in Newark, N. J.

DISTINCTIVE appearance, calculated to help sales, and a number of excellent engineering details making for durability and minimum service costs are among the interesting features of a line of trucks now being built by Arthur Rehberger & Son of Newark, N. J., for local distribution.

These trucks are assembled chiefly from component parts purchased from well-known automotive manufacturers, but the completed vehicles, which now are built in three, four and five-ton sizes, incorporate a number of elements which are somewhat unusual. In addition the designs are worked out in such a way that the wheelbase can be varied to meet various service requirements with a minimum of difficulty.

Wherever possible, parts are made interchangeable, not only on one size but as between different sizes, thus facilitating service and minimizing stock requirements. This is exemplified by the pedal unit, brake levers and brackets, clutch disks and many other parts.



Front view of Rehberger three-ton truck chassis modified for use in bus service

Among the features of interest may be mentioned the radius rods, which are steel castings of H-section with tapered holes in each end. Into these holes are fitted split bronze bushings, the outer diameter of which fits into the tapered hole while the cylindrical bore fits the pin on which the rod is pivoted. Turning up the nut on the pin causes the bushing to contract and take up wear as it occurs without renewal of the bushing. This construction is illustrated in an accompanying cut.

At its rear end the radius rod is supported on a pin carried in a bracket which is bolted to the spring saddle castings. The spring saddle is not cast integral with the axle but is made in two halves and bolted to machined surfaces near the ends of the axle housing.

Special care has been exercised in making the brake layout in such a way as to insure equal braking on both sides of the vehicle. To facilitate this the brake rods are carried back as near to the center line of the chassis as is feasible. In consequence the primary brake levers on the cross shaft are more nearly equidistant from the secondary levers on the same shafts than would otherwise be the case so that there is less opportunity than usual for twisting in the shaft to cause unequal brake application. A convenient adjustment of brakes is provided in the form of wing nuts of bronze with pointed ends which fit into suitable depressions in the brake levers against which they bear and are prevented from turning accidentally but at the same time are easy of adjustment and cannot rust to the brake rods.

Except in the 5-ton model which has an amidship gearset, the propeller shaft is divided and has a single bearing of the S.K.F. self-aligning type in a cast bracket

attached to the center frame member. This bearing is inclosed fully and is protected against entry of dust and water by felt washers.

On brake cross shafts, pedal shaft and the like where the loads are light, the motion small and the chance of good lubrication rather uncertain Nigrum oil-less bushings are employed. They are made with about 0.005 in. clearance and are said to give excellent service and to require practically no attention.

Pins in spring shackles and at other points where loads are heavy and lubrication not always of the best are made from chrome-nickel steel heat treated. Such pins are locked securely against rotation by seating in split bearings with tangent bolt fastening, thus tending to prevent enlargement of the hole and making it possible to take up wear and at the same time permitting easy removal of the pin when shackle bushings require renewal.

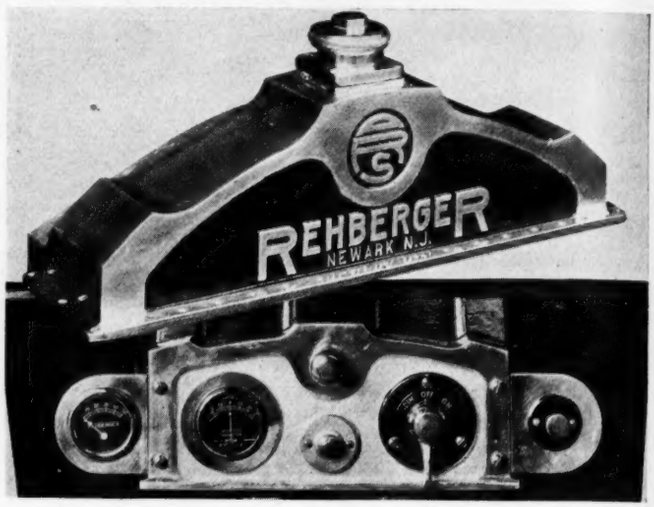
For economy in manufacture and ease of repair in case of injury, frame rails are made from rolled section channel with hot riveted cross members and gusset plates. The front cross member forms a bumper and consists of two ¼-in. steel plates between which is an oak filler block which measures 4 in. front to back at the center and 3 in. at the ends. The block and the plates are the same depth as the side channels

An interesting feature of the truck is the use of a radiator the top casting of which is of aluminum made in substantial and ornamental design. It bears the initial monogram of the maker as well as his name and address in raised letters against a painted background. The background of the monogram is in blue to match the color used on the manufacturer's advertising literature.

For trucks carrying electric equipment, an aluminum instrument board with contour similar to that of the radiator is fitted on the dash. The pressure gage and choke handle are mounted in separate castings at each end of the panel and are fixed to the dash. The panel is held to these castings by four screws which, when removed permit the panel, which carries the ammeter, lighting switch, magneto switch and cowl light, to be turned forward, thus exposing all electric connections. On the lower edge of the panel are two fuses in plain sight of the driver.

Three-point mounting is used for the engine as well as for the gearset when the latter is mounted amidship. The 5-tonner can be furnished with a supplementary gearset, sometimes called a two-speed clutch, if desired. This provides an extra set of four speeds and gives the very low reduction required in some work, at the same time permitting of high speeds when road conditions are satisfactory and long hauls necessary.

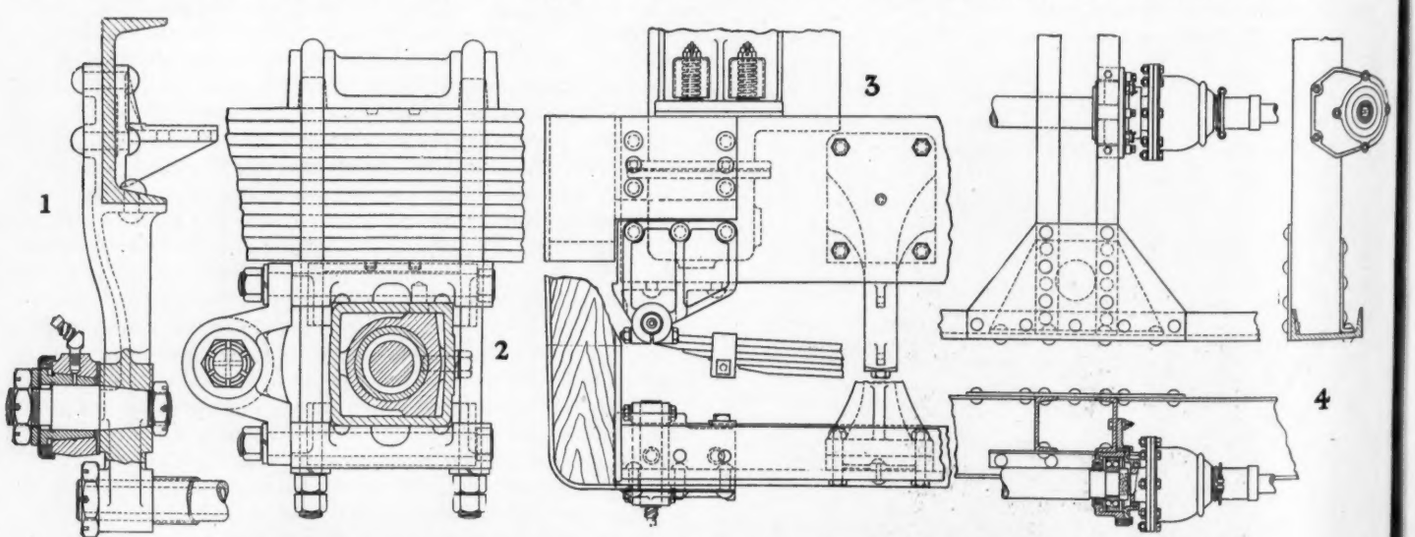
Among the standard units used in all models may be mentioned the Buda engine, Timken axles both front and rear, Fuller gearset and clutch, Gemmer steering gear, Van wheels, vacuum muffler and Bush radiator core. Chassis weight with standard wheelbase is given as follows: Three-ton, 6460 lb; four-ton, 7940 lb.; five-ton, 10,010 lb. Equipment includes K-P governor, Stromberg carbureter, Robert Bosch magneto. Same make generator and starter is extra.



Aluminum upper tank of radiator and instrument board with similar contour provided distinctive appearance

A number of 3-ton chassis have been modified for use in bus service. The changes include moving the front axle forward under radiator (in this case a Shuler dropped axle is used), use of Gruss air-springs in front together with modified front and rear springs, the latter being 60 in. long, use of 36 x 6 in. pneumatic tires on Budd disk wheels, a lower frame and raked steering gear mounting. Frame at door is 29½ in. from ground with full load and 25-passenger body.

A 2-ton model similar in construction to the heavier models will be in production in the near future.



Sectional views of: 1—*Front end of radius arm and bracket showing tapered bushing.* 2—*Rear axle near spring saddle showing radius rod attachment.* 3—*Front end of frame.* 4—*Center cross member and bracket support for two-piece propeller shaft*

Just Among Ourselves

Does the Woman Buy the Car After All?

DOES the woman have a strong influence on most car sales? Most men in the industry probably will answer "Yes" to that question without much hesitation, because the idea has been propagated very widely in the last few years. In fact, we believed it without much qualification until we were caught up by a prominent advertising manager the other day when we had been making conversation by repetition of the familiar "Well, after all, it's the woman who buys the car." Our statement this time, however, was met with "I'm not so sure about that. Did you ever stop to think that the trade-in price is the determining factor in a large proportion of the car sales made today, and that the woman rarely has anything to do with that phase of the purchase?" Well, we hadn't, and admitted it, although we always have prided ourselves on being a pretty good stopperandthinker. We are passing the question along to you, in case you hadn't thought of it either.

Education a Drawing Out Process

RECENT months have seen the development of some new ideas about dealer education. The assumption, current for many years, that education should consist of a "pouring in" process, is giving way to the sounder theory that it must involve at least an equal amount of "drawing out." An automobile or any other piece of merchandise is considered a success when those who get it and use it ask for more of the same kind. The efficacy of a manufacturer's dealer education methods may well be judged in about the same way. Are your retailers asking you for additional information along the same lines? This is the test. When a man is intensely interested in something his attention is so concentrated on the topic that he is not conscious that he is interested. One letter showing a desire for more data is a better recommendation than are ten epistles full of the general patent medicine sort of praise. Don't bother asking dealers if they are using the stuff you send them. If you can get them coming to you as a source of additional information you will *know* you are on the right track.

What Is It That Makes Conventions Go?

EVERYBODY in the automotive industry has had something to do with a convention of some kind in connection with his work. Many have had to have a part in running them, while the rest have had to sit through them. In either case, automotive men have a very definite interest in making them go right. Nobody doubts the value to be derived from a good convention, and everybody realizes the time to be wasted at a poor one. What makes 'em go? We'll be glad to have answers from everyone interested enough to write us their views. For the present we can say briefly that in our opinion advance publicity is one of the most important items. Advance publicity has a large part in determining the attendance and the attendance, both as to numbers and character of men present, usually is a good gage of the value to be derived from the discussions. Conventions in the automotive industry for the most part have been well above the average. But still there is room for improvement if maximum benefits are to be derived from such meetings. What would you suggest?

Why Is a Merger? Sales Needs Probably Answer Today

NO better example of the changing emphasis from production to sales problems is to be found than in analysis of the various mergers and rumors of mergers which have been going the rounds. Ten years ago, when two or three companies consolidated their forces, the basic reason for combination usually was to be found in the search for reduced overhead and increased manufacturing economies to be derived from larger scale production. Today, it would appear, mergers are more likely to take place because certain companies feel the need for consolidating their merchandising forces.

You Do Your Job and He'll Do His

WE aren't among those who sneer at all reformers, because we believe that healthy criticism of things as they are is well worth while and that even more commendation probably is due those who are trying to change bad things than those who are trying to prevent good things from being overthrown. Just the same it would be a good thing if more people recognized the difficulty of changing things in the merchandising world with extreme rapidity and the desirability of finding ways to work with men and customs as they exist. When J. H. Mehan told the M. A. M. A. executives recently that they should "take the jobbers as they are" and advised against "marrying them to reform them," he said something worth further meditation. The personality of individual men, the practices and customs of a merchandising system already established, the shortcomings of a particular group—all of these are a part of the automotive business problem. Change can and should be brought about, but progress is retarded rather than advanced by those who sit around and say, "We can't do thus and so because the other fellow *ought* to be this or that." If he isn't, he isn't. That's all. The fact that he isn't is a part of the problem.

Bus Axle Has Herringbone Gears in Final Step of Double Reduction

Is one of new parts recently announced to improve motor vehicle values. Other items include novel window regulator, a door check and a pneumatic suspension.

AN axle designed especially for bus service and incorporating herringbone gears in the final step of the double-reduction now is being marketed by the Eaton Axle & Spring Co. of Cleveland, Ohio. This is known as Model 60000, is of the full floating type and is intended for axle loads up to 12,000 lb. and for a maximum of 22,000 lb.-in. torque.

As will be seen from the accompanying drawing, the axle is made as shallow as possible from top to bottom in order to afford maximum road and body clearance. All parts contained within the central housing can be withdrawn from the rear, thus facilitating service operations and making it unnecessary to raise the body to inspect or remove gears.

Primary reduction is through spiral bevel gears. The bevel pinion is integral with its shaft, which is carried in one single and one double-row ball bearing. The bevel ring gear is bolted to a flange integral with a transverse shaft, also mounted on one single and one double-row ball bearing, and the herringbone pinion is splined to this shaft. It meshes with a gear made in two halves, which are meshed and run with the pinion before the two halves of the gear are positively attached to each other. This is said to overcome the difficulty heretofore encountered in securing the same bearing on both halves of herringbone gear teeth.

Live axles are splined into the differential side gears, while the differential cage is carried on two ball bearings. Wheel bearings are of the taper roller type with inner races mounted on the tubular extensions of the axle. These tubes are of chrome-nickel steel and can be varied in length in manufacture if desired to meet requirements of different spring centers.

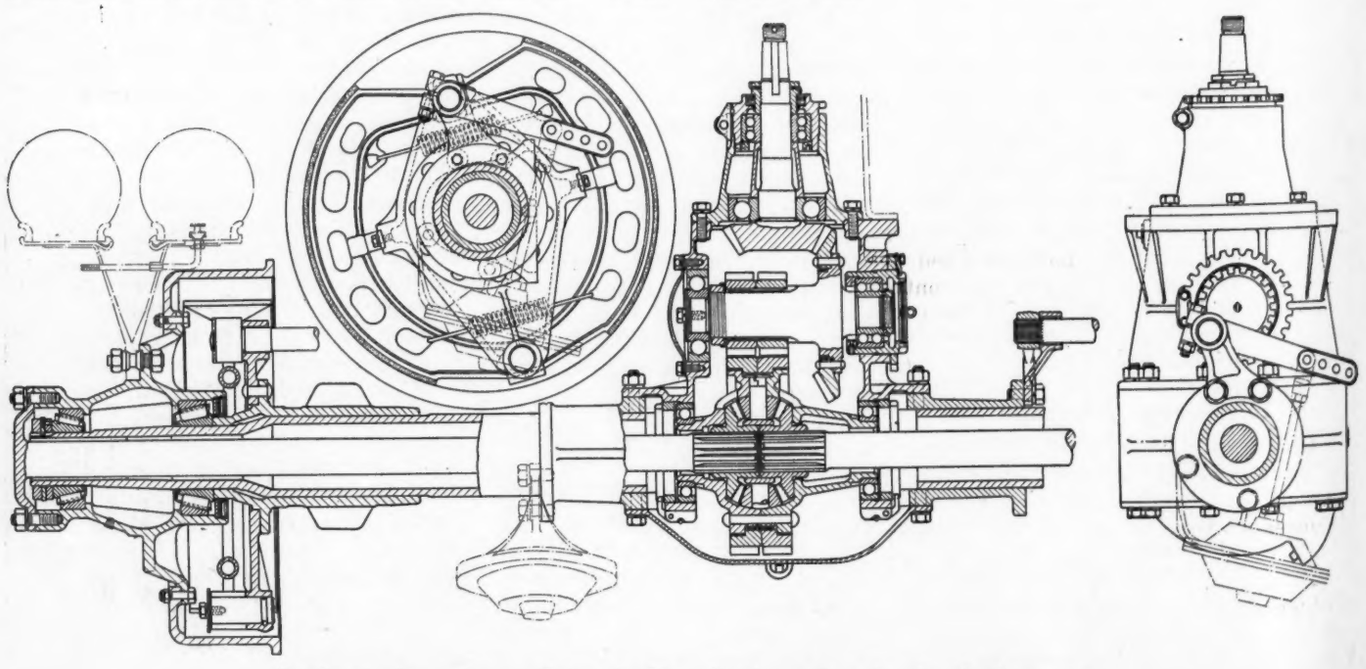
Each end of the center housing is flanged to provide convenient surfaces upon which to mount brake shaft brackets as well as diaphragms for operating air brakes when the latter are employed.

Brakes of either the contracting band or expanding shoe type can be furnished. Drums have 5 in. bearing face and are flanged when internal shoes are employed. The axle can be furnished for torque arm mounting or for Hotchkiss drive, as desired.

Hubs are made to accommodate disk wheels carrying 36 x 6 or 34 x 7 in. tires. Weight, including hubs and drums, is given as 990 lb. Available gear ratios are 4½ to 1 to 7½ to 1. Overall depth of housing is 13½ in. and the ground clearance is 11¼ in. with 36 in. tires.

Window Regulator Easily Installed

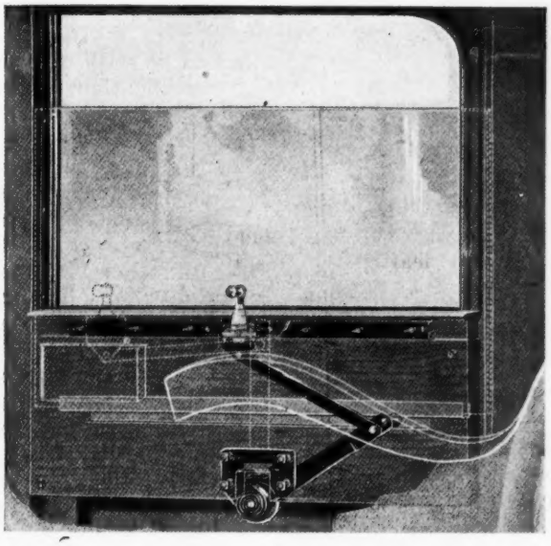
DIFFICULTIES ordinarily encountered in the installation of window regulators in the rear quarters of closed bodies are eliminated by the features of the new window regulator made by the Ternstedt Manufacturing Co. As this regulator is operated by a small handle which moves back and forth just above the window ledge, and has no projections below this line, it is not necessary to cut through the upholstery or spoil the contour of the rear seating arrangements as in the case of most crank operated lifts.



Sectional views of new Eaton double-reduction axle using herringbone gears

As illustrated herewith, the sash is raised and lowered by a projection at the outer end of a lever which is centered at a bracket near the bottom of the lock board. The motion of this lever is controlled by a link connecting with the operating head which is guided by a pressed steel channel that is screwed into the window pocket inside and just below the lower trim strip.

Control is obtained by the small handle situated above the trim strip. This handle controls the head which is arranged to lock when the handle lever stands vertical and unlock to allow motion when the handle is tilted in either direction. This tilting action fulcrums the operating head on lateral projections and lifts a tongue at its center. When the handle is released, this tongue engages with slots in the guide channel and if released at a plain portion of the guide channel, the vibration of the car brings the window down slightly to the next locking point. A counter balance spring at the lower center of the operating lever arm offsets the weight of the sash and makes operation of the device very easy. As the operating arm



Window is operated by control handle above trim strip; no other parts project inside of lock board

swings just over center in the top position of the window, locking at this point is positive.

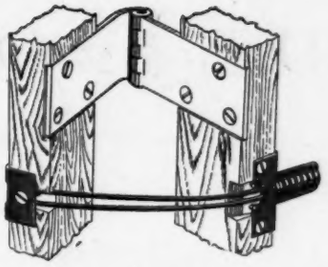
As the total travel of the wndow is 9 in., this regulator is designed particularly for installation in the rear quarter where the distance through which the sash can be raised and lowered is limited by the curvature of the body or the rear wheel pocket. However, the range of 9 in. has been found to be more than ample for the rear quarter windows of existing cars. As the guide channel and mounting bracket are both attached on the interior surface of the lock board and the control handle does not project over the window ledge, the entire quarter surface of the body interior is unobstructed.

Wire Loop Used in New Door Check

AN inexpensive concealed door check which is claimed to have considerably greater strength than the best straps or loops has been placed on the market by the Concealed Door Check Co. of Kokomo, Ind. This check is known as the Eastman and as shown in the accompanying cut, consists of a wire loop, the free end of which slides through a guide attached to the door pillar while the other end bears against a compression spring, which forms a part of the hinge pillar attachment.

It is claimed that the check has nothing to get out of order, jam or rattle. Pillar cuts are so shallow as to sacrifice practically no strength, while installation is simple and requires but three screws, a gimp tack for holding the bronze bearing plate in place and the cutting of two slots.

Eastman wire loop door check



Loops are furnished in three different lengths to suit installation conditions. The check is arranged to begin to stop when the door is open 82 deg.

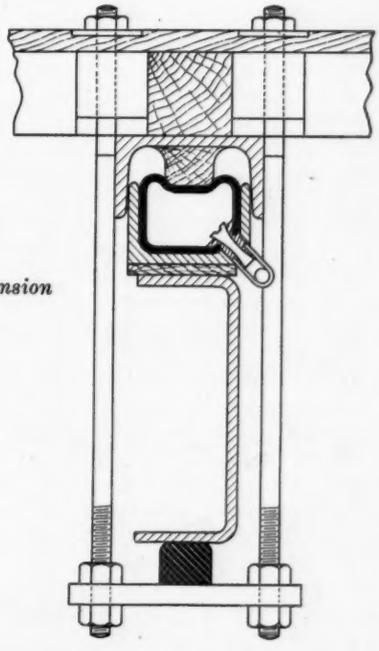
Body Mounting on Air Cushions

A PNEUMATIC suspension, apparently designed chiefly for motor buses and intended to supplement the spring suspension, has been developed by the Holden Suspension Co., Ltd., of Manchester, England. The device comprises two steel channels, one of which is fixed to or forms the chassis side bar, while the other is securely bolted to the body, the size of the inverted upper channel being such that it is a sliding fit over the lower one. Each end of the channels is suitably sealed, hence the channels form an assembly of rectangular boxes capable of vertical movement only.

The air tube employed is of the fabric insert type, with self-supporting ball type reinforced ends. These tubes, although quite pliable and resilient, are said to be capable of withstanding a pressure of up to 100 lb. p. sq. in. when in position in the channels. They are made of such size that the static pressure on them rarely exceeds 10 lb. p. sq. in., thus leaving a large margin of sustaining power for shocks.

A hardwood compression bar is fitted centrally inside the upper channel and extends the full length of same. An upward restrainer is fitted, which can be adjusted to meet any required inflation height.

Holden pneumatic suspension



Digging Dollars Out of Raw Material Purchases

When competition is keen the difference between buying to best advantage or on some less economical basis may spell the difference between profit and loss. Knowing when to buy important.

GENERALLY speaking, the primary production cost of most automotive products runs from 60 to 90 per cent material and the balance labor. For this reason there are few more important jobs in the factory than that of purchasing the material which goes into the machine or part manufactured.

In the present state of the industry competition is so keen that the difference between buying to the best advantage and buying on some less economical basis easily can become the factor which determines whether the plant operates at a profit or at a loss.

To buy materials right is quite as important as to sell the finished product right, but "right" in this case means a lot more than right price, though of course price is a most important factor. Buying right naturally involves a good knowledge of what, where and when to buy, which is another way of saying that a good purchasing agent should understand thoroughly differences between good and bad materials, should keep in touch with the sources of supply and should keep thoroughly posted on market conditions.

Purchasing agents should possess a reasonable knowledge of materials used in automotive work. Such knowledge is not difficult to acquire in most cases. If not acquired it must be made available through close coordination between engineering, production and purchasing departments.

Unless such coordination exists, the engineer may specify material which cannot be bought at a satisfactory price, the purchasing department may order material which is not suitable for the use intended, or the production department demand material which is worked easily but is not durable in service.

While these fundamentals may seem commonplace to many engaged in buying automotive products, the fact that they are disregarded in many plants makes logical their repetition.

Intelligent specifications are a most important factor in economical buying. In the first place the number of kinds and sizes of material should be as few as practicable, while in the second place specifications should have reasonably wide limits in order to include the products of as many vendors as are qualified to submit quotations. Special materials and non-standard sizes generally are to be avoided except in cases where the result secured amply justifies their use, since they seldom can be secured at such low prices as the standard article.

A somewhat extreme example of this was brought to our attention recently. A parts maker spent many thousands of dollars in developing what appeared to be an exceedingly promising article, only to find that a certain size and quality of steel had to be employed to yield the required results. This particular material could not be had in the open market and was available only if rolled specially at a price of over $1 per pound—a fact which made the cost of production of the finished article prohibitive in view of competition with other lines.

Specifications which appear desirable from an engineering or even a production standpoint are not always the most economical in the end. This is another reason for close coordination between the engineering, production and purchasing departments. Often the purchasing agent receives tempting offers from vendors of certain products which can be used to good advantage even though they do not meet exactly a given specification. In such cases it may be worth while to alter the specification, but this should not be done without due consideration on the part of the engineering and production departments lest the apparent saving be more than offset by some production or service difficulty.

For instance, suppose a manufacturer of brake lining finds a means of so constructing his product as to double its life without material increase in cost of production or alteration in other qualities. He would be able to quote a considerably lower price than his competitors if able to guarantee such life, but this would involve selling a thinner lining, which might not meet the purchaser's specifications. If the purchaser were satisfied on the matter of quality, as reflected in longer life after making such tests as are deemed necessary, he would be justified in altering the specifications providing the engineering and production departments agreed that the change involved was desirable.

Changing Supply Sources

A change in source of supply is a thing not to be considered lightly when the vendor who looses the business has rendered faithful and satisfactory service. A slightly lower price does not mean necessarily that a saving will be realized in the long run. Failure to make prompt shipments or to supply goods of requisite quality sometimes occasions delays which cost far more in the end than the saving in price realized. A de-

THIS article is the seventh in a series on "Profits vs. Volume." It outlines a few fundamental purchasing principles that should be incorporated in every effective buying plan.

For next week Harry Tipper has written an article called, "Why Not Discard the Double Standard in Buying and Selling."

Whether you are a general executive, a sales manager, an engineer or a purchasing agent you will want to read this remarkably keen analysis of one of the automotive industry's most important problems. It is an article which will be talked about for a long time after its publication.

pendable source of supply and assurance of fair dealing is an asset not to be cast aside without due cause.

Competitive bids on large orders always have been used as a means of securing low prices, and this method is far from being outworn. Genuine service, with assurance of prompt deliveries and a reputation for maintaining quality, must not be overlooked in following this practice, however, since apparent savings are converted into losses easily when the vendor fails to live up to his agreements, as he must do sooner or later unless allowed a fair profit on his sales.

A live purchasing agent, with good engineering knowledge or advice, will keep well posted on new developments in the trades with which he deals. Often a new product, procurable at a lower price than some product being purchased, becomes available as a result of development work and should be investigated. This calls for cooperation with engineering and experimental departments and frequently results in considerable savings.

Analyzing Material Costs

Material costs frequently are increased considerably by freight, express and handling charges which might be avoided or minimized by judicious buying. There are obvious advantages in purchasing from concerns near at hand when other things are equal. Dealing with an unreliable or uncertain vendor may involve rejections which are wasteful in time and bring about handling charges otherwise avoided. Concerns which go out to beat the other fellow's price at any cost sometimes are driven to produce inferior goods which fail to meet specifications. This calls for more careful and most costly inspection work on the part of the purchaser and if the material is rejected may mean delays which are far more expensive than to pay a fair price in the beginning.

An unfortunate practice followed by some purchasers is that of arbitrary return of materials which, for some reason which is no fault of the vendor, have not been used by the purchaser. Similarly unfair is the practice of cancelling orders, presumed to be placed in good faith, with consequent serious loss to the supplier, who may be greatly embarrassed because of his own commitments made as a result of securing the order.

To follow these practices may result in certain temporary savings, but in the end they must inevitably result in higher prices, because the material manufacturer must include losses of this character in the cost of doing business.

Knowing When to Buy

Knowing when to buy in some cases is quite as important as knowing what and where to buy. Especially is this true in the case of materials purchased in large quantities for use over an extended period of time. It involves not only a good knowledge of market conditions, but an intelligent prediction of future needs of the purchaser. There is a scientific method of estimating both future needs and price fluctuation within quite close limits—a method which requires a thorough knowledge of economics and which is employed by a few large corporations with exceptional success.

One such concern is the American Telephone & Telegraph Co., which, in some cases, estimates the growth of its business and the consequent demand for the materials required as much as five years in the future. This, in combination with a close study of and forecast of price fluctuations, makes possible large purchases when prices are at or very close to their lowest levels, while only such comparatively small purchases as are required for immediate needs are made to meet exceptional conditions when prices are high.

A concern buying on such a large scale well can afford to employ economists to collect and compile the necessary data, but the purchasing agent of any concern, small or large, if he will study market conditions and learn to follow such analyses as are made and published by those trained in work of this character, can secure far better results than are secured by a blind following of "hunches" with no logic back of them.

Hand-to-Mouth Methods

Buying from hand to mouth has the advantage of maintaining a low inventory, but it seldom is good economy unless prices are high and show promise of early decline. On the other hand, heavy inventories are a source of danger even when the goods are purchased at a low price level, unless the concern is quite definitely assured of a market and is in a position to carry the interest burden.

There are relatively few well managed and well established concerns which cannot count at least upon a certain minimum business for which materials can be purchased well in advance of consumption if market conditions and the cost of carrying stock warrant. This presupposes, however, that a careful estimate of production needs has been made and a schedule of such needs mapped out for several months in advance.

Manufacturers frequently find it desirable to maintain approximately the same production schedule the year around and often are willing to make some sacrifices in price in order to hold to such a schedule over periods which otherwise would be dull. Buyers often can take advantage of this fact, even though they are unable to use the materials at the same rate at which they are received. Here, again, however, discretion must be exercised to avoid carrying an unwarranted inventory.

Cyclic Price Variations

It is well to bear in mind that price fluctuations usually go through cycles which are repeated with more or less regularity. Sometimes the fluctuation is seasonal, but usually it is controlled or modified by such factors as the general state of business. A sound knowledge of economics and the factors which influence price fluctuation should be possessed by all executives and ultimately will be used to control business dealings.

One reason for rapid advance in automotive engineering work in recent years is that a great mass of reliable information not formerly available has been accumulated and is being applied to design and other problems. In consequence, the engineer does not have to depend only upon his own judgment, but knows, or should know, many of the laws which govern the outcome of work in which he is engaged. In short, automotive engineering is emerging slowly from the field of more or less intelligent guesswork into one of approximately exact science.

A similar change should and will take place in the business end of the industry. Purchasing will not be done on a haphazard basis, or even governed by what sometimes is termed shrewd judgment, but rather by a knowledge of economic laws which are operative today but which are understood only imperfectly and seldom are applied to the problems in hand.

Only by careful study of laws deduced from reference data made available through proper records and very practical research and analysis can we hope to realize all the dollars which are to be made as a result of the scientific purchase of material.

German-Built Automobile Operates Without Shifting Gears

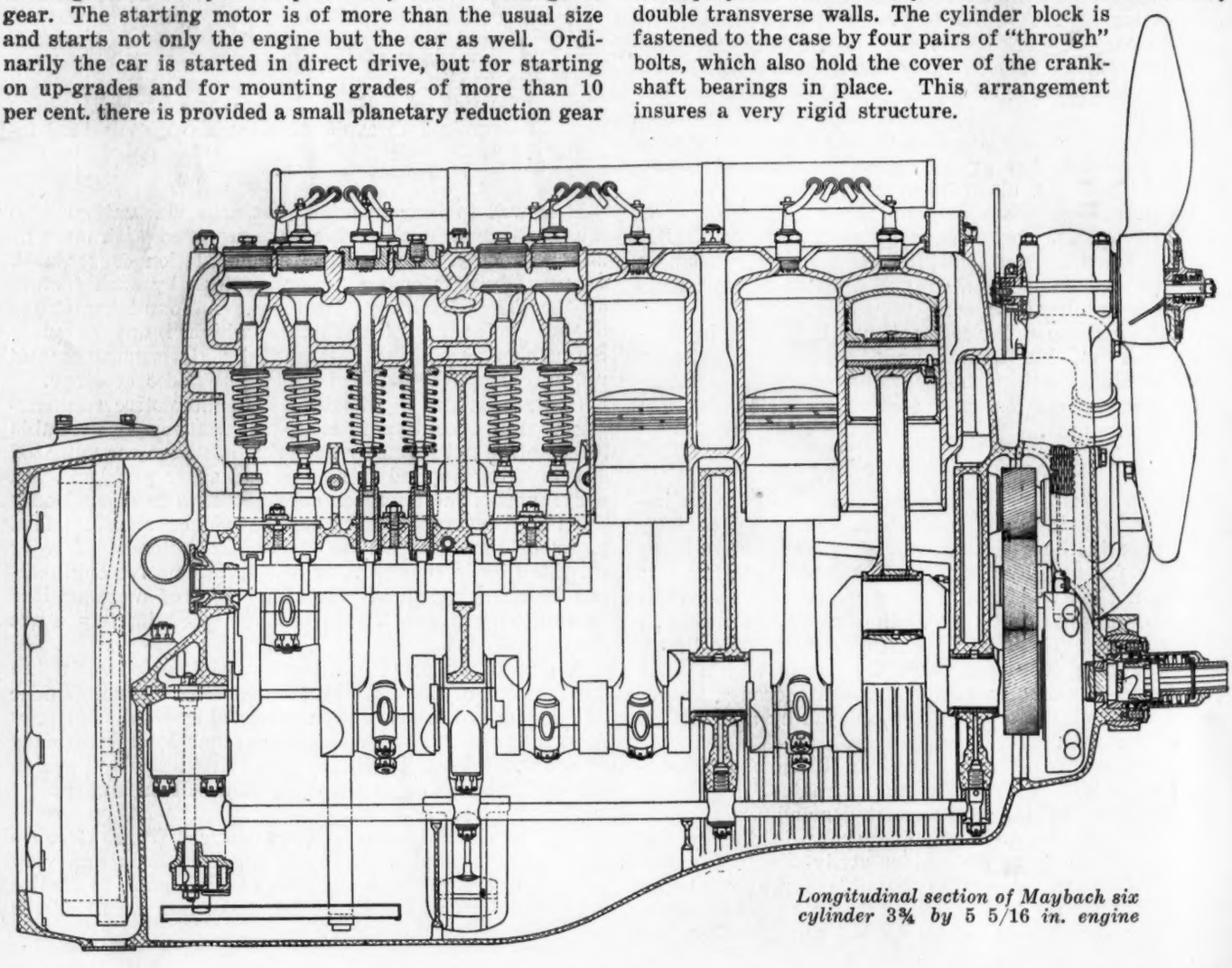
Maybach car uses planetary low speed gear only under extremely difficult road conditions. Electric starter normally starts car on direct drive. Engine and carbureter possess original features.

By Benno R. Dierfeld

A GERMAN car which is unique in several respects is the Maybach, manufactured by the Maybach Motor Mfg. Co. of Friedrichshafen, which concern also builds the engines for Zeppelin airships and is allied with the Zeppelin Works. Wilhelm Maybach in the early years of the automobile industry was associated with Gottlieb Daimler in the development of the Mercedes car, and he is generally credited with the introduction of the float feed spraying carbureter, the selective gearshift and the pressed steel frame—all features which are now used by a very large proportion of all car manufacturers.

The outstanding feature of the Maybach car is that it is designed to be operated practically without change of gear. The starting motor is of more than the usual size and starts not only the engine but the car as well. Ordinarily the car is started in direct drive, but for starting on up-grades and for mounting grades of more than 10 per cent. there is provided a small planetary reduction gear which can be brought into action by depressing a pedal. Release of this pedal causes the direct drive to be engaged automatically. Reversing does not call for the shifting or clashing of gears either; by depressing the reversing pedal, first the brake is applied and then the direction of the driving torque is reversed by means of a planetary assembly.

The engine has six L-head cylinders of about 3¾-in. bore by 5 5/16-in. stroke (95 x 135 mm.), cast in one block. This block set deeply into the aluminum crankcase, the walls of which extend from the crankshaft axis up to the valve pockets, so that only the upper part of the cylinder block projects. Below the cylinders the case is stiffened by double transverse walls. The cylinder block is fastened to the case by four pairs of "through" bolts, which also hold the cover of the crankshaft bearings in place. This arrangement insures a very rigid structure.



Longitudinal section of Maybach six cylinder 3¾ by 5 5/16 in. engine

Above the camshaft there is a longitudinal wall in which are mounted the oblique push rod guides. The lower part of the crank case is also an aluminum casting. The oil sump at the bottom of the crankcase has a capacity of 15 litres (3.3 gals.); it slopes downward from front to rear and there are cooling ribs on the side at the forward end.

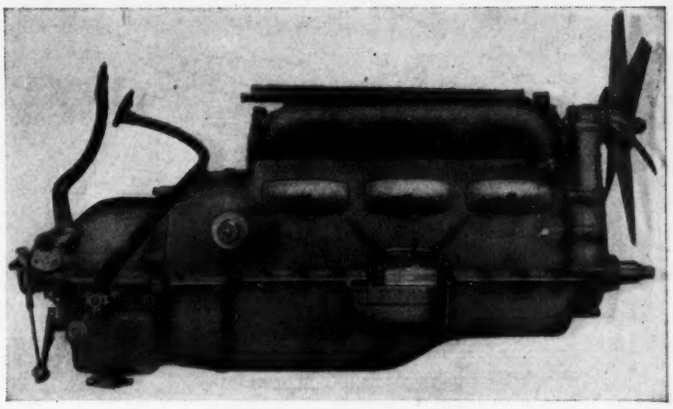
The engine is supported on the car frame at three points, two of these being at the ends of a steel tube passing through the upper part of crankcase at the rear; the third, a spherical trunnion bearing at the forward end of the case, which is supported on the front cross member of the frame.

The crankshaft is supported in four babbitted bearings, and a vibration damper is fitted at its forward end. The flywheel has a diameter of 18⅞ in., is flange-bolted to the crankshaft, and has the usual toothed rim for the starter drive. From the forward end of crankshaft the camshaft is driven by helical gears. The driving pinion on the crankshaft, which is flexibly connected to the vibration damper, is forged of steel, while the camshaft gear is made of phosphor bronze and is provided with felt inserts to make it non-sonorous.

The piston pins are locked by set screws in the piston bosses and turn in cast iron bushes in the small end of the tubular connecting rod. The big ends have the usual divided babbitted bearings.

A flange extending around the cylinder block just underneath the cylinder head rests on top of the crankcase, hence the cylinders project into the case, whereby a very simple outside form is secured.

The valve tappets, located in pockets on the right hand side of the engine, are provided with interchangeable cast iron guides. Each cylinder has two spark plugs, in the center of the cylinder head and over the inlet valve, respectively. The ignition cables are carried through a fiber tube along the cylinder head. The plugs located over the inlet valves are supplied with current from the battery; those in the center of the cylinder heads, from the Bosch magneto. Spark timing is controlled automatically by a centrifugal device inside the combined generator and magneto.

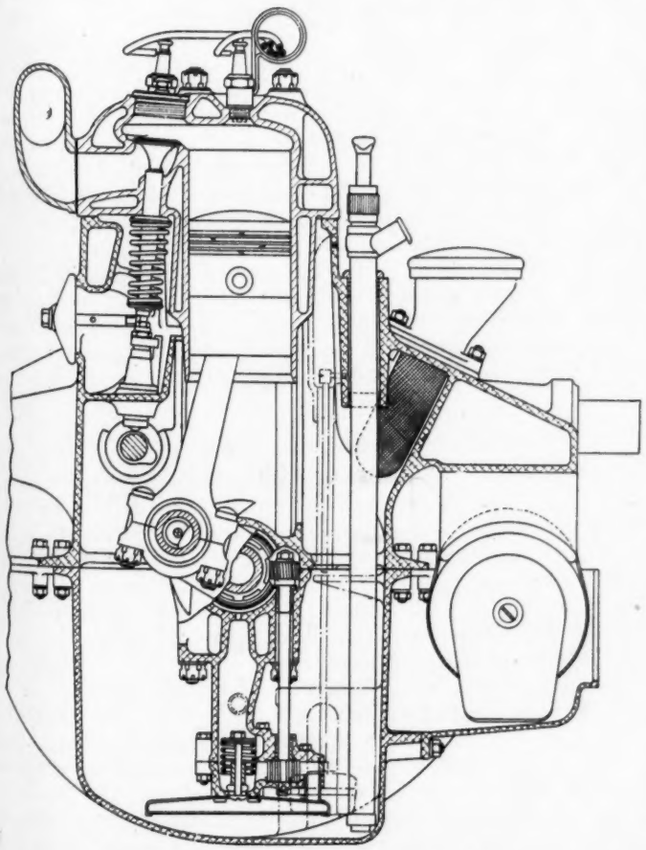


Powerplant complete

A gear type oil pump in the lower part of the crankcase at the rear is driven by helical gears and shaft from the crankshaft, the driving pinion being at the middle of the rear crankshaft journal. The vertical drive shaft of the pump has a bearing in the cap of the rear main bearing. This bearing cap is of unusual design and extends down to near the bottom of the crankcase to form a supporting bracket for the pump. Oil is admitted to the pump through a large flat strainer. The whole lubrication system is independent of the crankcase bottom half, which may be taken off without disconnecting any of the oil tubes or other parts of the system.

The distributing header is connected to the bearing caps in such a manner (see sectioned cap of forward main bearing) that any heat expansion of the crankcase does not cause undue tension in the tube. The pressure in the oil leads usually varies between 30 and 45 lbs. per sq. in., being controlled by a spring-loaded relief valve. Oil escaping from the bearings is led to the hollow crank pins by oil scoops and to the big ends by drilled passages. The piston pins are lubricated by splash.

A float type oil gage is provided. Near it on the rear crankcase arm is located the oil filler and breather. Oil and sediment can be removed from the bottom of crankcase by a hand pump located next to the gage.



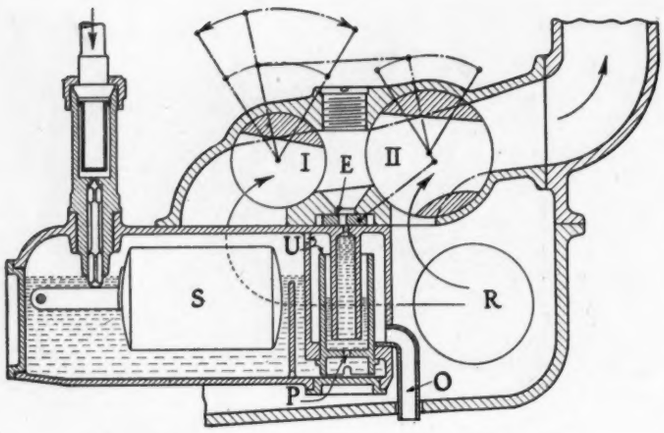
Cross section of Maybach engine

Water Pump Is Driven from Timing Gears

The water pump is driven from the timing gears, and the pump shaft drives the Bosch generator. Water passes from the pump through a short tube to the front of the cylinder block, thence through a cored passage (see cross section of engine) to the rear of the block and thence in the reverse direction through the whole water jacket, passing out at the forward end.

Fan drive is by silent chain from the crankshaft, the drive having a friction clutch incorporated in it so that the fan may be disengaged in cold weather.

The carbureter is secured to the right side of the crankcase and consists of two equal units which serve three cylinders each. Air enters the carbureter both from under the bonnet and from outside, through a connection with the tubular frame member, the air from under the bonnet being slightly preheated. The proportion of preheated to cold air can be adjusted in accordance with atmospheric conditions by means of a large rotating valve. Air is also



Diagrammatic view of Maybach carbureter

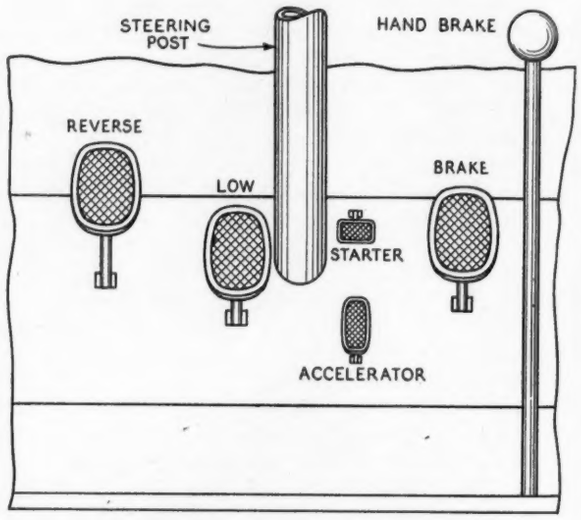
drawn in from the crankcase, through a tube connecting to a cover plate. Hence the interior of the crankcase is constantly at sub-atmospheric pressure, which tends to prevent the oozing of oil from the joints of the case, and thus to keep the engine clean. Danger of carbureter fires is guarded against by the provision of an overflow directly at the nozzle and above the normal fuel level, which disposes of any excess fuel.

Referring to the sectional view of the Maybach carbureter, pivoted metal floats control the flow of fuel into the float chamber. The fuel enters a standpipe U through the orifice P, which latter is so proportioned that at full load the fuel level in the standpipe is slightly below that in the float chamber.

Air enters at R and divides into two streams, as indicated by arrows. Valve I controls the main air inlet or choke, while valve II, which is positively connected to it, controls the supplementary air inlet and the passage to the cylinders. L indicates the idling position and V the full load position of the valve. Valves I and II are not only positively connected together but they also operate by eccentric and rod a valve E above the fuel nozzle, whereby the effective area of the metering orifice is varied. The float can be removed after taking out the threaded plug at the side.

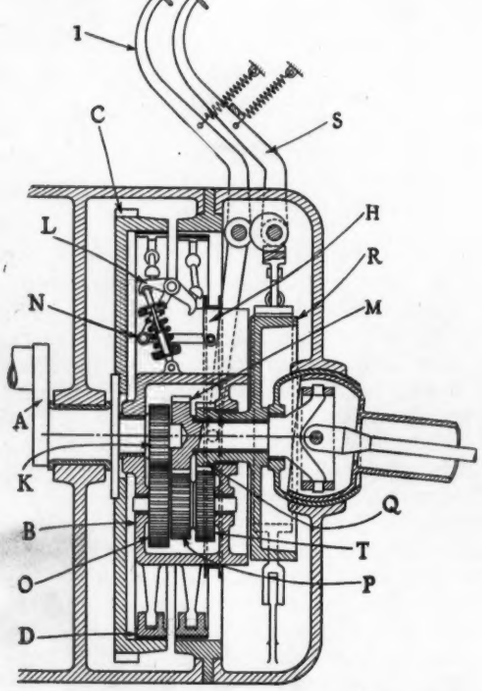
It is claimed for this carbureter that it gives a properly proportioned mixture for all engine loads and speeds. Nevertheless, means are provided for changing the adjustment of the fuel metering orifice from the steering wheel while the car is in operation. To this end a small finger wheel is mounted at the center of the steering wheel, being secured to the top end of a rod extending through the steering column.

Control of the fuel valve E is by means of a double eccentric on the spindle of the large rotating valve II. The main eccentric may be shifted around its axis by means of the fingerwheel on the steering column and thus the mixture enriched, for instance, when desiring maximum power for hill climbing or for a burst of speed. Evidence of the value of this device is seen in the low fuel consumption of the car, which is given as 16-18 liters per 100 km. (13-15 m.p. U. S. gal.) for long trips. The main eccentric is also adjustable by hand, this adjustment being made when fuel of a different grade is to be used.



Arrangement of pedals and control levers

The gaseous mixture flows through cored passages in the crankcase to the inlet valves, no exterior manifold being used. Should the float or its valve become deranged and the fuel rise in the float chamber beyond the normal level, it would drain off over the edge of standpipe U and the drain tube O.



Diagrammatic view of planetary low speed and reverse gear

No Gear Shift Lever to Use

As previously mentioned, the Maybach car has no gear shift lever and therefore requires no gear shifting. A two-speed planetary transmission, operated by pedals, is used. Referring to the diagrammatic sketch of this device, all shafts run on roller bearings and the clutch shoes are of cast aluminum with copper-asbestos lining. With pedal I in the position shown, the clutch shoes D, fastened to the pinion spider B, are pressed against the inside of flywheel C. The power of the engine is then transmitted directly from crankshaft A to the propeller shaft. On the other hand, if the pedal I is pressed down all the way, then through the shifting of the collar H and the rocking of double armed lever L the clutch shoes D in the flywheel are released while the clutch shoes R are pressed against the stationary housing by the coiled spring N. Now the pinion spider B is locked and power is transmitted through

the pinions K, O, P, M, with a reduction depending upon their respective numbers of teeth (about 2.5 to 1).

Pedal I can be locked in an intermediary position by means of a latch. Both clutches are then disengaged, and the gear is in the idling position. A dash pot retards the motion of the latch, so that it does not enter the slot if the pedal is released quickly, and therefore does not prevent the changing to direct gear. The sun wheel Q of the transmission serves for the reverse gear: it is connected with the brake drum R, which can be held from rotation by means of pedal S, after pedal I has been brought to the idling position. Then the transmission acts in combination with pinion T as a pure planetary gear. The universal joint used in this car has roller bearings.

One of the illustrations shows a portion of the dashboard with the control levers and pedals, and it will be seen that there are two more pedals here than in the conventional car. When starting the car it is usual to press down the low speed pedal with the left and the starting pedal with the right foot. The car begins to move immediately and after a few revolutions the engine picks up its cycle, whereupon the starting pedal is released by drawing the foot off it and moving it onto the accelerator pedal, directly below. The starting motor is then disengaged. A moment later the low speed pedal is also released.

When it is necessary to start on steep hills, or in winter time when the temperature is very low and starting is difficult, the engine can be released from the drive and started separately.

In order to reverse the direction of motion, the clutches are first released as described, and then the reversing pedal is pressed down. Starting backward from a standstill is accomplished in the same manner as forward starting, by means of the starting pedal. In an emergency the reversing mechanism forms a powerful transmission brake.

It is the recommendation of the manufacturer that the clutches should never be released while the car is under way, particularly not when the brakes are applied. Then, whenever the car is stopped the engine is also stopped, and this saves fuel.

It is admitted that, as compared with a conventional car of the same engine power, the Maybach has a lower maximum speed, but this is claimed to be more than balanced by its greater acceleration, which permits high average speeds.

The regular shaft tube is supported at the forward end by a ball joint on which all driving and brake reactions are taken up. The tube is divided at the middle, where a ball bearing is inserted to support the hollow propeller shaft.

Rear Axle Housing of Aluminum Alloy

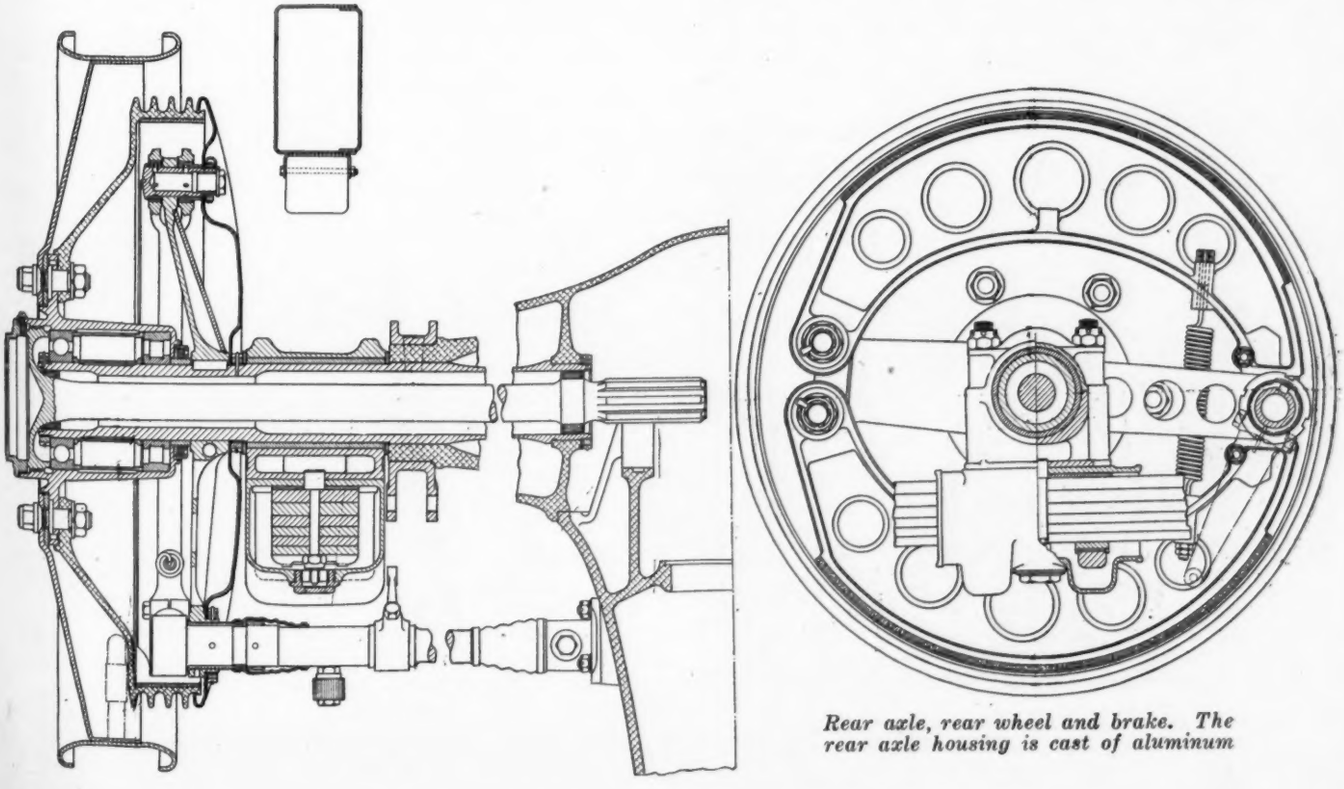
The rear axle housing consists of an aluminum alloy casting in which steel axle tubes are inserted. A trumpet-shaped casting, also of aluminum alloy, is bolted over the opening in the front of the central housing and forms the gear carrier. Roller bearings with a ball double thrust bearing are used on the axle at the differential and on the bevel pinion shaft. The axle is of the full floating type.

Brake supporting disks are keyed to the steel axle tubes. The brake drums are cast of aluminum and are provided with cooling ribs and steel liners. The brake sectors also are aluminum alloy castings and are provided with asbestos-copper facings.

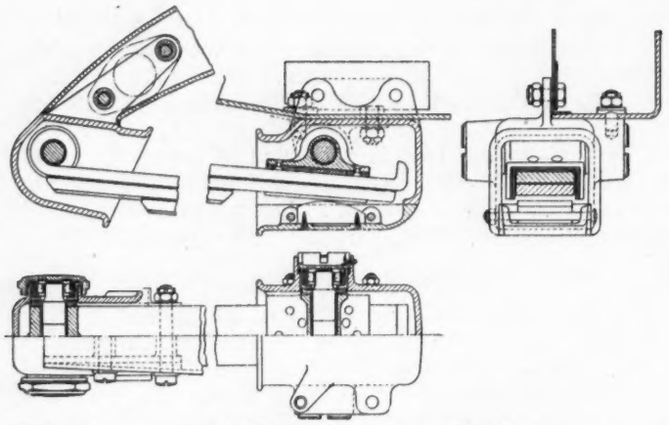
Semi-elliptic underslung springs are used in the rear. They are swiveled on the axle tubes, their saddles being bushed with woven asbestos. Perforated leaves of thin sheet iron are inserted between the spring leaves, the perforations being filled with grease. All of the springs are provided with oil-tight leather covers.

Special designs of spring brackets are used all around. The forward end of the rear spring, as may be seen from the accompanying illustration, slides in a shoe which is lined with wire-asbestos fabric and which is rotatable around a bolt. This bolt is secured into a housing riveted to the frame side member and is provided with roller bearings on which the shoe rocks. A similar design of bracket is used at the rear end of the rear spring, which latter is subjected only to vertical loads and side thrust. Hydraulic type shock absorbers are regular equipment.

Referring to the illustration of the front axle, the front



Rear axle, rear wheel and brake. The rear axle housing is cast of aluminum



Original type spring brackets

wheel brake has its sectors expanded by a wedge at the lower end of a thrust rod, which is free laterally. This rod is moved axially by a steep pitch screw, the nut of which is fastened to the hollow knuckle pin by pin screws; a dome-shaped piece is keyed to the screw, and the brake operating lever is secured to this by means of clutch jaws. The brake cables are guided in slots formed in the frame side member, and the braking effect is said to be entirely independent of the position of the front wheels in steering.

Long cables are used for connecting the cross shaft under the driver's seat to the front brakes. Since the thrust rod is free laterally it presses equally against both brake sectors. In order to make adjustment possible when the brake lining is worn, the thrust rod is not connected directly with the steep pitch screw, but through an adjusting rod or pin, which can be turned by means of a hand wheel on top of the steering knuckle.

An interesting brake equalizer is used on this car, based on the principle covered by the Maybach patent reviewed on page 520 of the Sept. 18th issue of AUTOMOTIVE INDUSTRIES, though differing somewhat in detail. The brake equalizing mechanism is inclosed in a housing on the powerplant and operates in an oil bath. Between front and rear the brake application force is unequally divided, the rear brakes being applied more energetically.

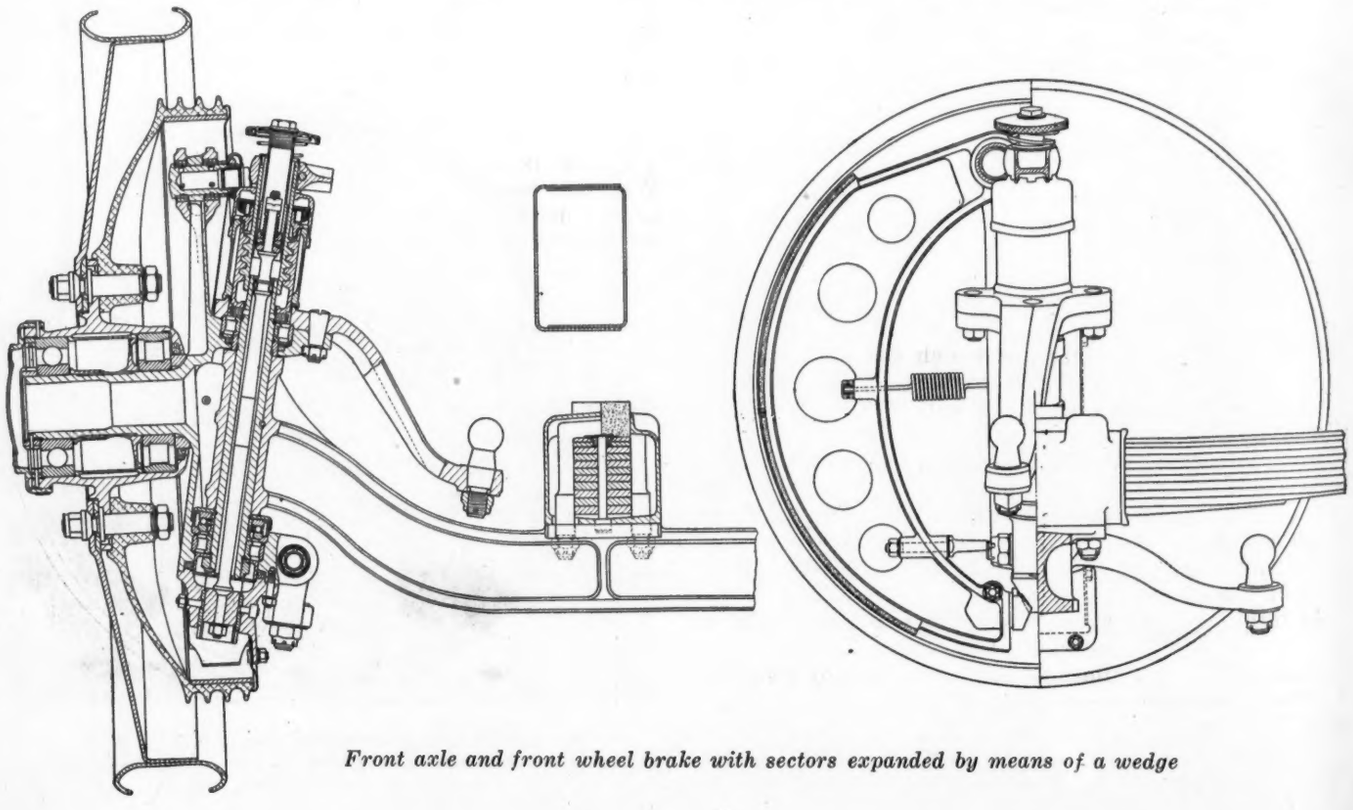
The rear wheel brakes are adjusted by means of worm wheels fastened to the cross shafts extending from the brake equalizer housing. These worm wheels carry the brake cable pulleys and may be adjusted by hand by means of worms. The four cross shafts extending from the brake equalizer are connected with dial plates on the frame side members. When the brakes are correctly adjusted and are applied by the lever, all pointers on these dials are in horizontal positions, each pointing to the brake with which it is connected.

Screw and Nut Steering Gear

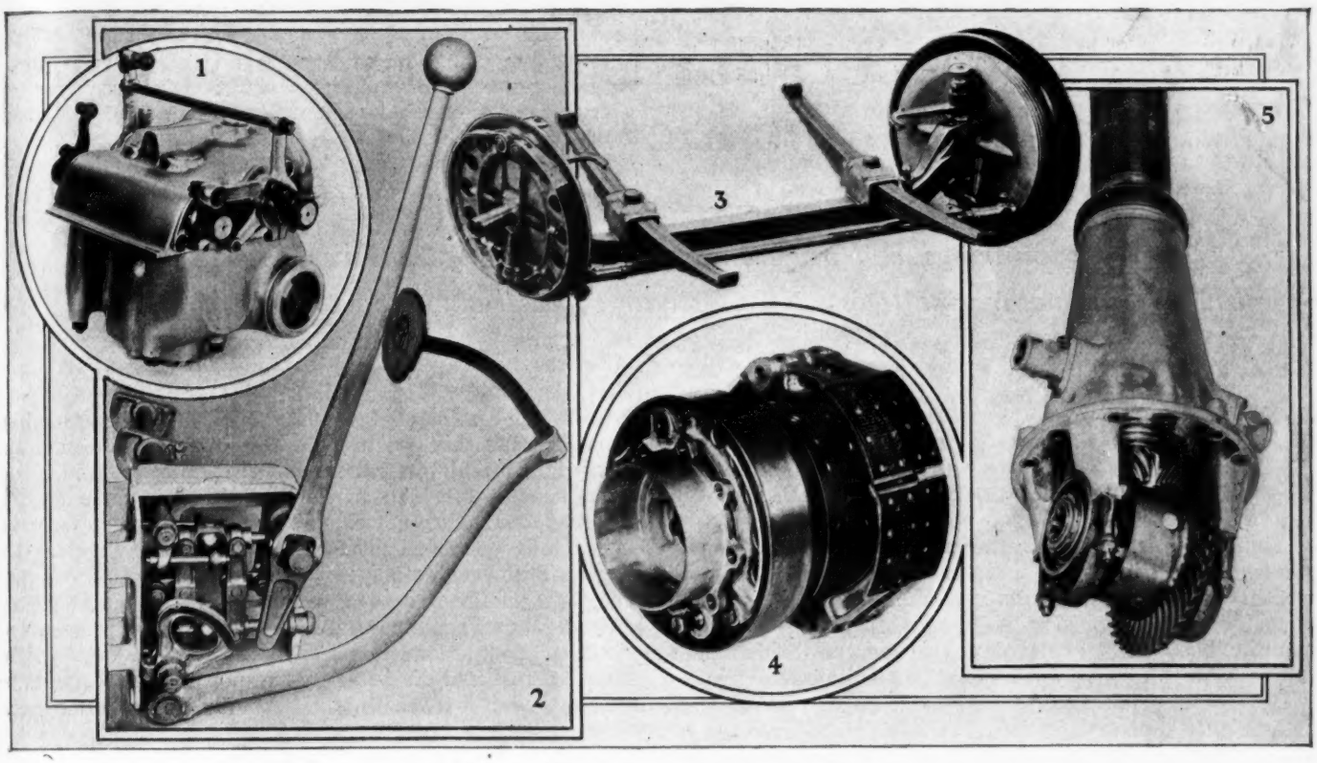
The steering gear is a screw and nut device. The steel screw is hollow, has a trapezoidal thread, and turns in roller bearings. The bronze nut is babbitted. Two shackles transmit the movement of the nut to a forked lever pressed over the spliced steering arm shaft, which latter also turns in roller bearings. The steering case is a bronze casting. The cast aluminum steering wheel is covered with hard rubber on both rim and spokes.

To the lower flange of the frame side member is welded the wide running board, the weld rising at the ends, where the fenders begin, to the upper edge of side member. This stiffens the side members and makes valances unnecessary. Directly back of the radiator there is a hollow cross member and behind the rear axle a tubular cross member, both of which are flange-bolted to the frame. Two pressed steel intermediary cross members are welded to the side members.

The fuel tank has a capacity of 32 gallons, and is supported from the rear tubular cross member by means of steel bands. There are two copper feed tubes from the main tank to the vacuum tank. The one through which the feed takes place ordinarily does not extend all the way down to the bottom of the tank, and when only about 5 gal. is left air enters this tube and the driver is given



Front axle and front wheel brake with sectors expanded by means of a wedge



Details of Maybach car
1—Outside view of carbureter. 2—Brake equalizer assembly. 3—Front axle and front wheel brake. 4—Transmission assembly. 5—Rear axle driving unit.

warning that his fuel supply is running low. Then, without leaving his seat, he turns a valve and the feed takes place through the other tube (which extends down to the bottom of the main tank) until the fuel supply is replenished again.

Following are some of the chief dimensions of the Maybach car: Tread, 58 in.; wheelbase, 144 in.; ground clearance, 9.5 in.; front tires, 35 x 5.3 in.; rear tires, 35 x 5.9 in.; weight of chassis complete, 3650 lb.

Motor Operated Differential Lathe Chuck

THE E. Horton & Son Co. of Windsor Locks, Conn., manufactures a differential lathe chuck which has now been adapted for production work by the application of an electric motor.

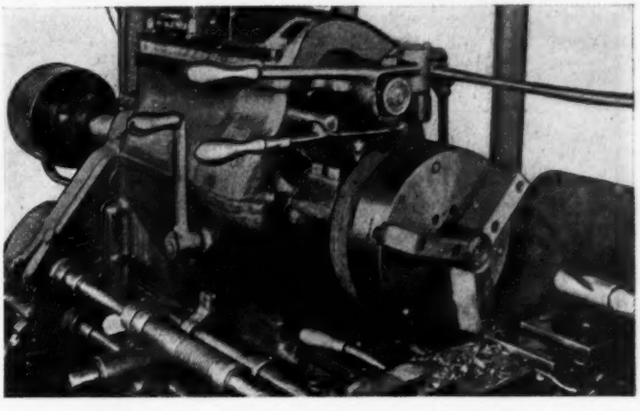
The operation of the chuck is based on the principle of differential pinions meshing with internal gears. The hand wheel, by means of which the chuck is ordinarily operated, carries five double spur pinions, one section of each piping meshing with the backing gear, which is pinned to the body of the chuck, while the other section meshes with an internal gear on the reverse side of the scroll. The difference in the pitch diameters of the two internal gears causes the scroll to be rotated with a large reduction in speed, one revolution of the handwheel opening the chuck approximately 1/16 in. (measured on the diameter).

In tightening the work in the chuck, a hammer action is produced by the lost motion of the handwheel, which is multiplied many times when transmitted by the scroll to the chuck jaws. A similar effect is produced in releasing the work.

In operation the handwheel is spun to bring the jaws down to the work, and a quick push then tightens the grip on the work, while a quick pull releases it. For power operation a friction shoe controlled by the lever is used to hold the handwheel stationary while the chuck revolves.

Motor operation is by means of sprockets and a chain, which replace the friction shoe, or through the spindle of the lathe where this is better adated to the conditions. It is claimed that by the application of an electric motor to the chuck the chucking time has been reduced to 1½ seconds.

AN investigation of the possibilities of chromium plating is being made by the Bureau of Standards. What the bureau is chiefly interested in is the hardness of the deposited chromium and its possible application on gages and printing surfaces. Results so far have been somewhat erratic.



Horton motor-operated differential lathe chuck, the motor being shown attached to the rear of the lathe spindle

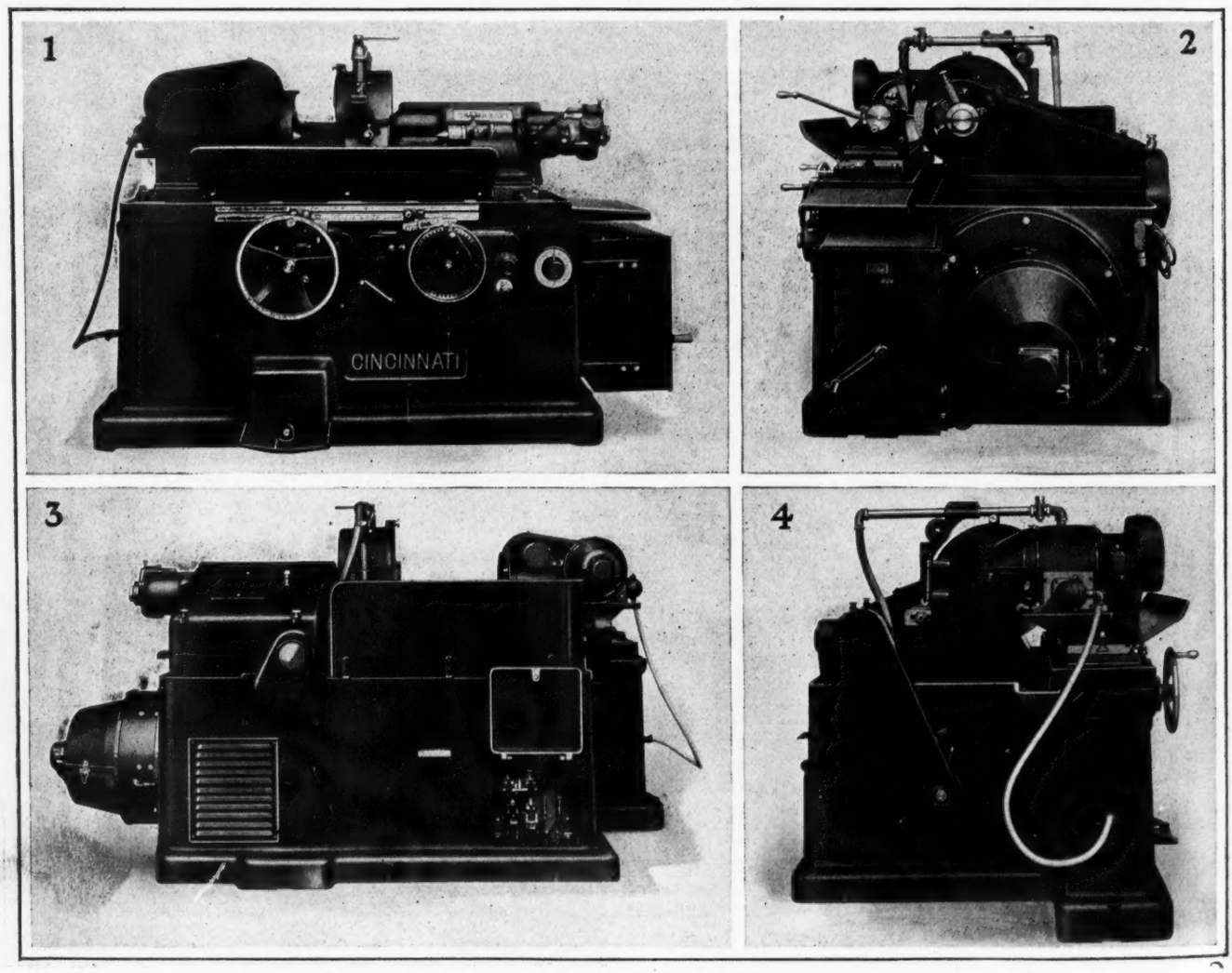
New Plunge-Cut Grinder Is Driven by Three Built-in Electric Motors

Machine which is entirely self-contained will grind not only piston rings and roller bearing parts, but transmission and armature shafts as well. Grinding faces range from 2 to 7 in.

By W. L. Carver

IN the new Plunge-Cut grinder, made by the Cincinnati Grinder Company, grinding wheels with from 2 to 7-in. face width are fed directly into the work. The machine is driven by three built-in electric motors, driving the wheel spindle, headstock and cross feed mechanism respectively, and it is therefore entirely self-contained. In spite of its massiveness and the great width of steel permissible, which, with the power characteristics, insure a high rate of production, this machine has a very sensitive control system, which makes it available for work demanding close limits.

Developed primarily for the grinding of piston rings and of ball and roller bearing parts which are assembled on mandrils, this machine is also adapted for grinding long cylindrical parts, such as transmission and armature shafts, but the method of handling such parts differs from the usual one by which the work is traversed with a slight advance into the wheel at the beginning of each stroke. When ground on this machine the work is fed in to the wheel in overlapping sections of just under 7 in. maximum width. Each of these sections is brought down to a size slightly larger than the required finished diameter by the power in-feed, and the long cylinder is then finished to size by traversing the



1—Front view of Cincinnati 12 x 18 inch plunge cut grinder. 2—Right-hand end showing motor application. 3—Left-hand end showing headstock motor application. 4—Showing mounting of headstock control panel and dynamic brake

table rapidly by hand. Because of the heavy loads set up by a 7-in. face wheel at high rates of feed, the built-in electric motor type of machine is recommended, although when desired a countershaft drive can be supplied. The latter arrangement is less desirable, however, as the power requirement may run as high as 20 hp. and it is difficult to keep a countershaft driven wheel up to speed under this load.

Heavy One Piece Casting Used

As shown by the accompanying illustrations, the base, wheel slide, pedestal and water tank are one heavy casting. The table is moved longitudinally only by the hand feed, which is supplied by a large wheel on the front of the bed. The wheel is moved only transversely, by either a hand feed at the front or a small electric motor which operates a continuous in-feed mechanism. The work table carrying the electric driven headstock and footstock can be swiveled for grinding tapers without the necessity of throwing the centers out of line. This assembly is carried on a sliding table which is equipped with adjustable stops. The latter are arranged to index with gates in the body of the machine, so that the table is brought to the same position for each operation (such as shouldering) on duplicate parts. Each of the basic portions of the machine is made up as a separate assembly and subjected to automotive standards of inspection for interchangeability.

A constant speed, 20 hp. motor of 110-220-440 volts, direct or alternating current, is mounted in the left end of the machine by means of an adapter ring. A pulley on the inner end of the armature shaft connects to another pulley on the wheel spindle through a 7-in. endless belt, the tension of which is controlled by idler pulleys. Where countershaft operation is desired this motor is replaced by an assembly carrying tight and loose pulleys and a shifter lever. The wheel spindle is held in half bearings by the tension of the belt, and shoes are placed above to prevent jumping in case of belt breakage. Ring oilers are used at this point, and an oscillating mechanism is located at the outer end of the spindle. This mechanism is individually controlled, and when placed in operation shifts the wheel endwise 50 times per minute. The movement is 3/16 in., which is sufficient to obviate the formation of continuous grain marks on the surface of the finished part.

Wheel Guard Built of Boiler Plate

The wheel guard, which is large enough to accommodate wheels of 20-in. diameter and 7-in. face, is built up of boiler plate of ½-in. thickness and is welded together, and the cover is of similar construction. The entire wheel head assembly is mounted on large chilled transverse ways, one of which is of the Vee-type and the other flat. In addition to the customary hand feed, consisting of a ratchet and pawl arrangement, an adjustable speed, fractional horsepower motor is built into the feed mechanism and is controlled by a rheostat located on the front of the machine. When this motor is utilized 12 speeds of in-feed, varying from 0.054 in. to 162 in. per minute are available. Stops for both the electric and hand feeding mechanisms are provided to insure accuracy of finished sizes.

Since the machine is intended primarily for straight-in feeds, the table is traversed by the hand wheel on the front of the bed, one revolution producing ½ in. of travel. The headstock spindle is driven by a built-in electric motor through a silent chain and worm and gear combination. The worm of this set is hardened steel, as are all of the gears in this machine, while the worm gear is bronze. Where direct current is used at the headstock 24 speeds are available, and rotation is quickly stopped by a dynamic brake which is interconnected with the treadle shown at the front of the machine. When alternating current is used 4 spindle speeds are available and the treadle is connected to a drum-type contoller with provisions for quick stopping.

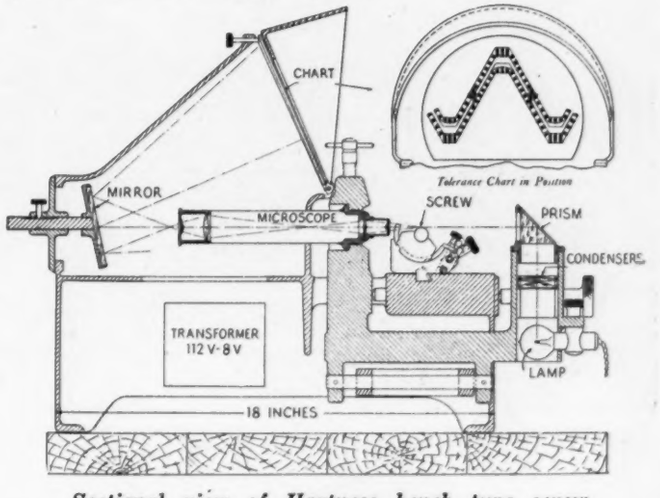
All of the controls for the various parts of the machine are located on the front within convenient reach of the operator. Water guards are of ample dimensions and the water tank has a capacity of 60 gal. Circulation by the centrifugal pump is at the rate of 25 gal. per minute. Back rests for long work are available, and the footstock is fitted with a bracket for carrying a diamond tool for dressing the wheel. This operation is performed with the hand feed for the table and can be done without removing the work from the centers. Adequate oil reservoirs and either wicks or spring operated rollers are provided for the lubrication of the various adjoining surfaces. When in operation the machine is supported at three points and these same points are used when machining and scraping the ways.

Four sizes of this machine are standard, all having a nominal swing of 12 in. and an actual swing of 13 in. The nominal lengths are 18, 36, 48 and 72 in., and the actual distance between centers is 1 in. more in each case. The required floor space is 68 in. wide for all sizes and the length ranges from 117 in. for the small machine to 171 in. for the largest. This is the total requirement, as the machine is entirely self-contained. The weight varies from 10,300 to 13,400 lb.

Bench Type Screw Comparator

A SMALLER and more compact form of the Hartness screw comparator, known as the bench type, has been brought out by the Jones & Lamson Machine Co., Springfield, Vt. The comparator, it may be recalled, is an instrument for the comparison of the pitch diameter, form and lead of screw threads with a master and to show the extent to which any of these elements varies from the master.

Referring to the sectional illustration of the bench type, shown herewith, light rays from a 6-8 v. 32 c.p. incandescent lamp pass upward to the prism, which reflects them across the work to be gaged. The rays then pass through the microscope to the mirror and back to the chart. The operator sits directly in front of the machine. The outline of the thread, magnified fifty times, is shown on the tolerance chart, at approximately 15 inches from the eye, where it can be readily observed.



Sectional view of Hartness bench type screw thread comparator

New Commercial Vehicle Models Illustrate R

TWO new speed trucks with capacities of 1¼ and 2 tons respectively have been brought out by the United Motors Products Co., Grand Rapids, Mich. The new models are designed for rapid transportation service and have a speed rating of 35 m.p.h. The wheelbases are 131 and 150 inches respectively.

Both models use a Hercules Model OX (four cylinder 4 x 5 in.) engine. The radiator core and tanks are removable, which simplifies maintenance. The fan is 18-in. in diameter and is driven by a 1½ in. belt. The carbureter is a Zenith and adjustment is provided on the hot air intake to meet weather conditions. Electrical equipment includes a two-unit, American Bosch starting-lighting system, Prest-O-Lite 6-volt battery, and a high tension magneto.

Brown-Lipe clutches and transmissions, mounted as units with the engine, are used on both models.

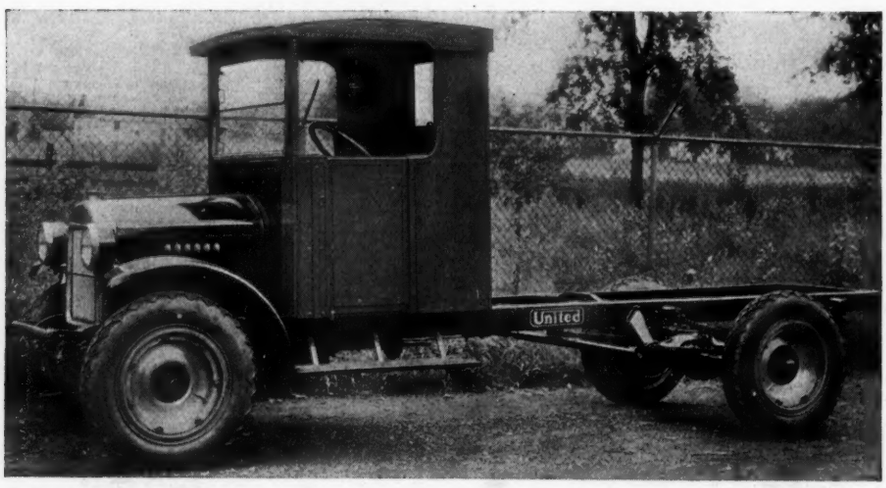
In the smaller model, the rear axle is a three-quarter floating Columbia with helical reduction gears providing a ratio of 5.1 to 1. The 2-ton model has a double reduction Wisconsin axle. The overall reduction is 7 to 1. Radius rods consisting of one main leaf of spring steel and two auxiliary leaves are used in both models. These rods extend from the spring seats on the axle to brackets riveted on the frame side rails for the purpose. Front axles have the usual I-beam section and the steering gears are of Lavine make.

Channel section, pressed steel frames are used in both models. In the 1¼ ton job, the channels are ¼ in. thick, have a depth of 4 7/16 in., and a flange width of 3½ in. There are three well-gusseted cross members in addition to the bell housing which also serves as a cross brace. The overall length of this frame is 182 in. and the width 33 in. The side rails used in the frame of the 2-ton model are 5⅝ in. deep with 3½ in. flanges, and are braced by four cross members. The overall length of the frame of this model is 206 in. giving a loading space back of the seat of 115 in. The frame width is the same as in the smaller model.

The front springs on both models have eight leaves and are 2¼ in. wide and 39¾ in. long. The rear springs are 52 in. long in each model but the widths are 2¼ and 3-in. for the small and large model respectively. In the 1¼ ton truck, the service brakes are 16 in. in diameter with a 2½ in. face. They are of the contracting type on drums at the rear wheels. The emergency brakes act internally on the same drums, their diameter and face width being 15⅝ and 2¼ in., respectively. On the larger model, the service and emergency brakes operate internally on separate drums at the rear wheels. The diameters of the two brakes are 16¾ and 12¼ in. respectively; both have face widths of 2½ in.

Pneumatic tires on demountable rims are regular equipment on the two models. On the smaller truck the size is 30 x 5 in. and on the larger, 32 x 6 in. The former model is regularly equipped with cast steel wheels while the latter is fitted with the cast aluminum disk type.

Standard equipment includes tools, jack, tire pump and pressure oil gun for the Alemite chassis lubricating system. The headlamps are of the barrel type with nickel rims. The radiator shells are also finished in nickel. The running gear and wheels are painted a burnt orange and the hood, dash and fenders have a baked black enamel finish.



One of two new lightweight trucks brought out by United Motors Products Co.

Gasoline Electric and Trolley Bus Developed

A PASSENGER service undertaking in the North of England, jointly controlled by two municipal authorities, operating a fleet of 21 trackless trolleys, has lately developed a new type of vehicle able to run as a self-contained unit beyond the limits of the trolley system.

The new vehicle is really a gasoline-electric bus, with means for utilizing current from overhead wires as an alternative to that generated by the gasoline motor connected to a dynamo. The chassis is a Tilling-Stevens gasoline-electric adapted to the purpose mentioned. The control is effected by a four-position change-over switch permitting: A. Running as a gasoline-electric bus. B. As a trolley bus. C. A neutral position. D. For engine starting.

The master controller for both systems is operated by a pedal, while the design includes provision for starting up the engine from the overhead wires prior to changing over to independent running. The body at present in use is a single-deck type carrying 32 passengers.

Recent Progress in Development of Design

NUMEROUS improvements have been made in the Model B 3-ton truck of the Four Wheel Drive Auto Co. of Clintonville, Wis., but the policy of the company that any new parts of its trucks must be interchangeable with parts of the same model built in previous years has been adhered to.

The seat frame is now made a two-piece assembly and the seat has been lowered 5 in. and moved back 4 in. to provide more leg room for the driver. The section of the seat frame over the engine can be easily removed without disturbing the control units, steering post or radiator. This makes the engine more accessible and gives a more comfortable seat for the driver. One part of the seat plate is made removable, to permit access to the engine from above.

In order to make it possible to carry more oil in the engine and so to keep down the temperature of the oil, the oil well has been increased in size and now holds ten instead of six quarts. A small reservoir is provided in the center of the base and is surrounded by a screen. All oil returning from the oil lines enters this reservoir. Oil overflows the top edge of this reservoir through the screen and works its way back toward the oil pump. All sludge and sediment accumulates in the reservoir and can be removed by taking out the plug in its bottom, while the crankcase can be drained of all oil by removing the sump plug.

An increased number of leaves is used in the springs all around, twelve in the front springs and fourteen in the rear ones, and this adds to the strength of these parts. The rear cross spring has been eliminated. All spring eyes are now bushed for 7/8-in. spring bolts, while formerly 5/8-in. shackle bolts were used.

A number of changes have been made in the carburetion system. The inlet manifold now has a hot spot, and a Stromberg M-2 1¼-in. carbureter has been adopted and is placed on the exhaust side. This is a smaller carbureter than previously used, but it handles low grade fuels to better advantage. Relocation of the carbureter entailed a redesign of the governor, which is now driven by a rigid instead of a flexible shaft and at engine speed instead of half that speed, which makes it more sensitive.

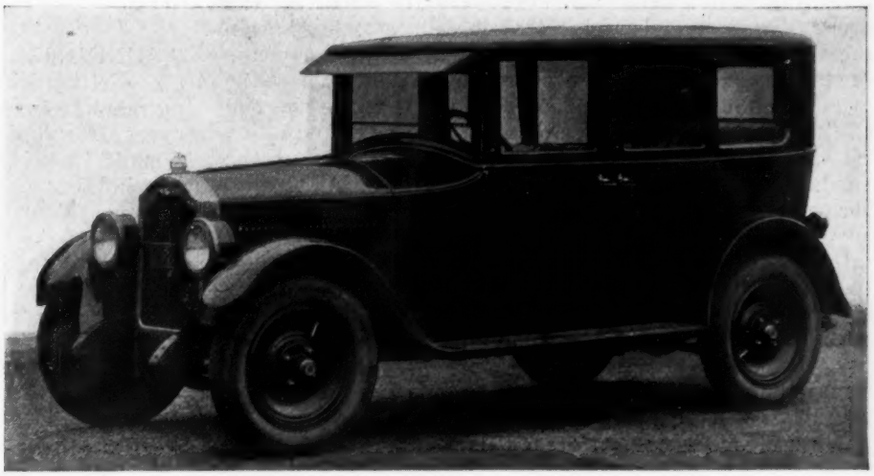
With a view to increasing the life of the timing gears, the idler gear stud has been increased in diameter and provided with an outboard bearing in the cover plate. A new type of oil ring is fitted to the piston at the lower end, and is said to cut down the oil consumption materially. A short aluminum breather and oil filler has been substituted for the long one formerly used, and facilitates the introduction of oil into the crankcase.

Squared joints were formerly used on the axle shafts, and these have now been replaced by splined joints, whereby the axle strength is claimed to have been increased by 40 per cent. The Dot high pressure chassis lubricating system has permitted of doing away with all grease cups and reduced the time required for lubricating all chassis bearings to one-fourth. An oil gage placed on the dash now permits the driver to observe the operation of the engine oiling system. The oil grooves in the lower halves of the connecting rod bearings have been omitted.

A differential lock control attachment located centrally on the dash permits the driver to engage the lock from his seat. The frame cross member behind the transmission is now made of heat-treated chrome nickel, instead of carbon steel, and heavier braces are used in fastening the rear end of the sub-frame to this cross member.

The differential screw type steering gear has been replaced by a cam lever type, which is said to have less internal friction. The reduction in the gear is also much greater than formerly.

A number of changes have been made in the transmission brake, which in this truck acts on all four wheels. The drum diameter has been increased from 10 to 11½ in. and its width from 3½ to 7 in. The brake drum is now mounted directly on the end of the transmission shaft.



AMBASSADOR "Drive-It-Yourself" sedan, which the Yellow Cab Mfg. Co. have in production and which is intended primarily for sale to operators of motor livery service. Known as model D-1, it will retail at $1,695 f.o.b. factory.

It is equipped with Continental six-cylinder, L-head engine with a bore of 3⅛ and a stroke of 4¼ in. The body is custom built by the Yellow Mfg. Co., seats five, and is upholstered throughout in Spanish leather. The wheelbase is 114 in. and the body is finished in dark blue. Brakes are on the rear wheels with the emergency on the transmission

The FORUM

Properties of Benzol

Editor, AUTOMOTIVE INDUSTRIES:

During the war, German automotive engineers tried fuel containing varying amounts of benzol. They found that by increasing the proportion of benzol to a certain amount, a maximum number of miles per gallon of fuel was obtained, whereas with either more or less benzol the number of miles per gallon was decreased.

It is desired to obtain information regarding these tests and the success obtained by the use of this fuel, particularly information concerning the following points:

1. Carbon deposit directly due to the combustion of fuel.
2. Effects of benzol on cylinder and piston wear.
3. Effects of benzol on the valves.
4. Crankcase lubricant dilution.
5. Whether or not it makes the starting difficult when engine is cold.
6. Effect on power—whether an increase or decrease is noticed.
7. Tendency of engine to overheat.
8. Economy.

I suggest these questions so as to bring up a discussion on this subject by the different automotive engineers.

MARSHALL T. GARLINGER.

Benzol is largely used in France and Germany as automobile fuel at the present time and is regarded as a high grade fuel. The only difficulty with it is that it has a rather high freezing point and therefore is unsuitable for use in very cold weather. Benzene, which makes up about 70 per cent of high grade or light benzol, congeals at about 38 deg. Fahr., but the commercial benzol, which usually contains some 25 per cent toluol, with a freezing point of —58 deg., has a freezing point of about 22 deg. For this reason benzol is generally blended either with gasoline or with gasoline and alcohol.

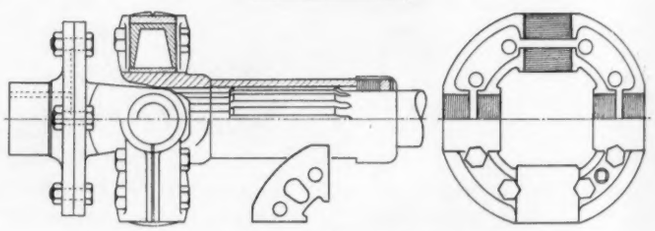
The heat value of benzol is greater than that of gasoline and a somewhat greater mileage is usually obtained with benzol when used in the same engine as the gasoline. One great advantage of benzol is that it will not cause knocking with a compression ratio of as high as 7 to 1, while the maximum which can be successfully used with gasoline in automobile engines is about 4.5 to 1. As the thermal efficiency of the engine increases with the compression ratio, a gallon of benzol when used in an engine with the maximum practicable compression ratio will give about 25 per cent greater mileage than a gallon of gasoline used in an engine employing the highest permissible compression ratio for that fuel. Therefore, where the engines can be specially adapted to benzol, gasoline and benzol are substantially on a par from the economy standpoint if a gallon of benzol costs 25 per cent more than a gallon of gasoline. On the other hand, if both fuels must be used in the same engine the mileage advantage of the benzol would probably not exceed 10 per cent.

While we do not know of any tests on the subject, we would expect crankcase dilution to be less troublesome with benzol than with gasoline, for the reason that the so-called heavy ends in gasoline have much higher boiling temperatures than the heavy ends of benzol. Of the so-called 90 per cent benzol, 90 per cent of the total distill over at below 212 deg. Fahr., while with the different grades of gasoline on the market in this country it takes from 320 to 400 deg. Fahr. to distill over 90 per cent of the total.

Experiments made by the London General Omnibus Co. with benzol-alcohol-gasoline mixtures showed that a heavy tarry deposit formed on the inlet valves and on the surface of the combustion chamber wall some distance down from the head, which required periodical cleaning of the combustion chambers. This firm also found that the particular mixture it used attacked the fuel tank and fuel lines and made it necessary to use lead-coated steel for these parts. It was later found, however, that the corrosive action was due chiefly to the alcohol and could be prevented by the addition of a slight amount of caustic soda.

In this connection it must be remembered that benzol is a refined fraction of crude tar oil, which latter contains many impurities, including phenolic acids, sulphur compounds and nitrogen compounds, and that the fuel is likely to cause trouble unless it has been carefully refined.

Any readers of AUTOMOTIVE INDUSTRIES who have used benzol in automobile or truck engines and can throw additional light on some of the questions asked are invited to write us their experiences.—EDITOR.



Hartmann universal joint with tapered adjustable bearings

A UNIVERSAL joint of the fork and ring type which is distinguished by conical adjustable bearings, is being manufactured by the Hartmann Mfg. Co., 308 Pearl Street, Hartford, Conn. The ring is a drop forging and is made in halves; it is hollow and forms an oil reservoir holding enough lubricant to last a season, it is claimed. Four bearing hubs are formed in the ring, two for each of the two forks. Into these hubs are screwed bushings with a conical bearing surface, to take the conical pins or ends of the forks. Evidently any wear at the bearing surfaces can be taken up by screwing the bushings farther into the hubs. The bushing is locked in position by a dust cap.

The two halves of the ring are held together by means of eight cap bolts and a velumoid gasket is placed between the halves to insure an oil-tight joint. All wearing parts are case-hardened. A filling plug or Alemite fitting is provided on the ring. Complete propeller shaft assemblies are furnished by the company.

EDITORIAL

The Election and Business

IF assurance of what governmental polices are to be will stabilize business, the election results should give industry considerable stimulus. The uncertainty which has characterized the economic and political situation for several months has been removed by the election of Calvin Coolidge and the assurance that the governmental policies which have been in existence for the last four years will continue during the next four.

Early election returns show an almost complete collapse of the LaFollette movement, indicating that a vast majority of the American electorate is opposed to radical changes in the present economic order. This verdict should have a favorable effect on the automotive business along with the other major industries of the country.

Facts Should Precede Action

AFTER widespread newspaper publicity resulting from the death of five men working with tetraethyl lead at a Standard Oil Co. New Jersey plant, the Ethyl Gas Co. product has received practically a clean bill of health from the Bureau of Mines as regards its danger in exhaust gases. Public health authorities in Philadelphia, New York and several other metropolitan centers acted far too hastily when they made drastic rulings forbidding the sales of gasoline containing tetraethyl lead. All the data available indicates that they acted without first getting the complete facts.

While no one will wish to weigh commercial needs against danger to human life, business organizations are entitled to fair dealing from public officials; they are entitled to public action based on ascertainable facts, rather than on near-hysteria. This right is not altered because the health officials in question later may change their rulings. The commercial damage already has been done. The reversal of the ruling can never be expected to get equal publicity with the promulgation of the original edict.

The manufacturing hazard in connection with this product is not denied, but every precaution has been taken to avoid danger to the workers and the hazard as it exists today probably is not nearly so great as in the production of many other materials which daily serve the public interests.

Dawes Plan and Exports

FOREIGN markets have held up well during 1924 and the total automotive export business bids fair to surpass that of last year by a considerable margin. Prospects for next year are bright, since the 1924 markets should continue to be good and the working out of the Dawes plan may open up sales areas in Europe which have been closed for several years.

While the operation of this plan undoubtedly should have a favorable effect, practical merchandising results cannot be expected from it at too early a date because several important phases of the agreement still remain to be worked out. Willis H. Booth, president, International Chamber of Commerce, who had an important part in the framing of the Dawes plan, pointed out this fact clearly in a talk to business paper editors the other night.

To get the original plan across, he said, it was necessary to eliminate from it most points of contention. Those points have to be worked out sometime, he said, and include such important items as determination of the aggregate amount of reparations, the allocation of payments among the various debtors, and devising of ways of moving large amounts of wealth from one country to another without wrecking either the debtor or the creditor. The adoption of the original plan, he indicated, is of value chiefly as providing an atmosphere of cooperation and mutual friendliness upon which future negotiations may be based.

British Elections

THE return of the Conservative party to power in England was not altogether unexpected, but the majority they have secured was much greater than anticipated and the effect of this majority is to give the Conservatives control of the legislation in the immediate future.

It came into power, not so much because of a belief in its program as because of a dislike for the radical Socialist program and as a rebuke to Labor on that ground.

The election should help business by dismissing such questions as "capital levy" from practical political consideration, and it is likely that the near future will show increased business developments in Great Britain.

It is not likely that the Conservatives will take any immediate steps to reinstate tariffs. Even if the McKenna duties are considered, they will hardly be altered until the consideration of the next budget, which takes effect Aug. 1, 1925.

Parliament meets in December and must be organized. After that it is probable that the Conservatives will introduce some reform bills, perhaps along housing and other lines.

The principal effect of this election in the near future, therefore, so far as the automotive business is concerned, will be the reflection of any increased trade of Great Britain itself and will hardly arise from any change in the tariff situation.

Our Industry Today—

Business Holding Well to Normal Seasonal Curve Despite Hesitancy in Buying Incident to the Election Period

NEW YORK, Nov. 3.—Some improvement in the sale of automobiles will probably follow the election, but no marked advance in volume can be expected from now until the close of the year. Pre-election hesitancy has been felt in all branches of the automotive industry, as it has in other lines, and to an extent has retarded sales. Despite this, however, business has held well to the normal seasonal curve.

Where activity among the farmer trade has been in evidence there have been no signs that pre-election conditions have been disturbing. Farmers are getting good prices for their crops and the results of the election have not appeared to enter deeply into their arrangements for spending their earnings. It is true that farm buying has reached no great proportion and will not this year unless a sudden turn in the disposition of the farmer generally takes place but at the same time there is some buying going on. The general attitude of the farmer is to spend slowly and buy only to the extent that his needs require.

Car production in November is not likely to be as great as in October and will suffer a further drop next month unless manufacturers, in the meantime, set out to accumulate stocks for spring demand. This seems improbable in view of the expressed desire of producers to forestall any overstocking condition such as was experienced during the spring of the present year.

Production May Drop

In all likelihood the next two months will see a marking of time on the part of the manufacturing branch of the industry until the show season is formally launched with the holding of the New York exhibit. On the attitude of show visitors producers are able to base their manufacturing programs for the first part of the year.

Tire output, which maintained high levels for several weeks, is showing a downward movement but it is felt that the decline will be halted once the election is out of the way. Spring dating business will come in this month and will be reflected in augmented manufacturing schedules. Continuance of good motoring weather, no doubt, has been a strong factor in keeping programs higher than usual for this period. The increase in tire output was one of the surprises of third quarter operations.

Trucks Keeping Steady

Truck business has been keeping to a conservative pace with little deviation in production totals from month to month. The same gait followed in the past is likely to continue through the rest of the year.

Several Car Mergers Likely to Come Soon

Aim Is to Reduce Expenses, Increase the Market and Add to Dealer Profits

DETROIT, Nov. 5—Several combinations of car companies are promised in the next three or four months by manufacturers who are directly interested in proposed mergers. Development of unusually good business following this election may cause these combinations to be postponed temporarily, but there is a feeling of agreement that only in combination will these companies, regardless of present strength, look to the future with safety.

Possibly the foremost reason for combination will be to reduce administration and sales expense, thereby lowering the prices of cars and increasing the general market. The secondary reason will be to establish complete lines of cars in different price classes; to give dealers a full line of cars, thereby increasing their opportunity to prosper.

The companies mentioned in the several possible combinations are for the most part those which might be properly described as manufacturing specialty cars. There are none of the large producing companies, but they are all companies which have been getting out a good volume of business for a number of years and whose finances are in good shape to enter into a merger with good chances of it working out successfully.

One of the mergers would tend toward a complete combination of three to four companies, each manufacturing a car in an individual price class. There would be one central operating company, the others operating as divisions. One group of executives would administer the complete property.

Under the plan of the other combination, one company would take over the products of two or more other companies and sell them through one dealer organization. The manufacturing identities of these would be kept separate, but only one company would maintain a sales department—taking over and selling the cars of the others, according to set schedules.

The forming of the combinations would place the companies concerned in a position to build up dealer organizations which would rank with the strongest in the industry, according to the plans. Many of the cars are being sold by dealers in combination with others at the present time, and the merger, therefore, would be greatly to their advantage in that it would give them the complete lines at considerably lower prices because of factory economies.

One of the most prominent of the executives, who is working on merger plans, said that his company was simply in a position where it either had to hook up with several other cars in other price classes or prepare to build complete lines itself. Dealers handling specialty cars, he said, require other lines to get the volume of business necessary for satisfactory profits.

This condition, he said, applied not only to the dealers in the smaller cities, but in the larger cities as well. Dealers to get all the profits they are entitled to should sell cars in all price classes.

Three years from now, he predicted, practically all dealers will be selling complete lines of cars, this including not only dealers in large cities, but dealers in large cities handling even the large production cars. Dealers cannot handle one line of cars in the future, he said, and get all the business that their establishment entitles them to.

Willys Predicts McKenna Duties Will Be Restored

NEW YORK, Nov. 5—A strong possibility that the McKenna duties on automobiles and other articles will be restored, with the return of Conservatives to power, is seen by John N. Willys, president of the Willys-Overland Co., who returned from England yesterday.

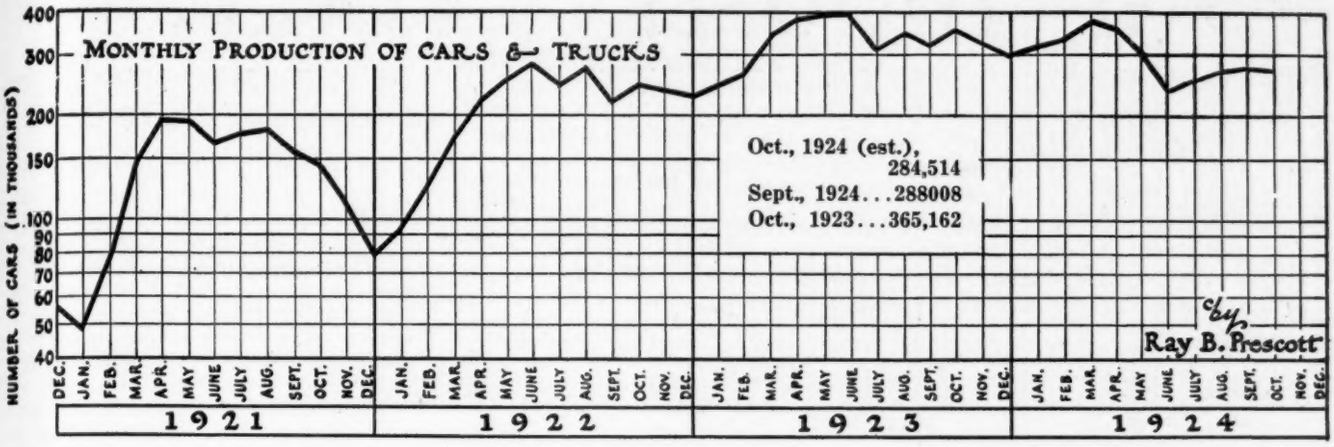
"These duties may not be so heavy as they were," Mr. Willys said. "I think, however, a duty will be placed on American-made cars."

Mr. Willys also said that Willys-Overland expected to export more than 20,000 cars by the end of the year.

CPC MANUFACTURE MOVED

DETROIT, Nov. 3—The manufacture of CPC balanced pressure Ford replacement steering gears developed by the Recording Devices Co. of Dayton, Ohio, has been moved to Detroit, where production of a new model is now under way The CPC Products Co. has been formed by H. G. Diefendorf, R. T. Wingo and C. E. Sweet to carry on the business.

OCTOBER PRODUCTION PLACED AT 284,514



Shows 1.2 Per Cent Decline from Total of Previous Month

NEW YORK, Nov. 4—An estimate based on shipping returns, made by the National Automobile Chamber of Commerce, places October production of cars and trucks at 284,514. This is 1.2 per cent below September's revised figures and 11.5 per cent below October of last year when the total of 365,162 was reported.

This total is not based on the full month's reports, the estimate having been made with the last few days missing in order that the usual statement could be placed before the N. A. C. C. directors at their meeting to be held here tomorrow.

For the 10 months' period, production has totaled 3,112,349 as against the record breaking count of 3,357,131 in the same period last year, a drop of but 7 per cent.

Little Variation in Pace

There has been little variation in production in the last three months in which 851,698 cars and trucks have been turned out. Comparing it with the same stretch last year there is a difference of 186,277, for in August, September and October, 1923, the industry was running at its fastest pace, the count being 1,037,975.

This time the manufacturers are going slower, taught to be cautious by the overstocking that took place last spring. There is no reason to believe that there will be much deviation from this production pace in the remaining months of the year and, going by this, the industry expects that the year's total will be approximately 3,600,000.

The wonderful fall weather general throughout the country is believed to be responsible for the big number of cars and trucks being turned out. Cheated of many sales by the miserable spring which upset all calculations, manufacturers and dealers now find unexpected business on all sides and give the Indian summer due credit for it.

Figures Show Slight Falling Off in Production in October from Figures Reported in September

NEW YORK, Nov. 4—Estimates based on shipping returns by the National Automobile Chamber of Commerce place October production of cars and trucks at 284,514, a decline of 1.2 per cent from September.

The following table gives the statistics for the first ten months of 1923 and 1924:

	Output		Carloads		Driveaways		Boat	
	1924	1923	1924	1923	1924	1923	1924	1923
January	316,278	243,554	46,474	35,423	41,489	30,972	1,023	728
February	367,527	276,955	52,224	36,137	42,594	43,620	427	882
March	382,474	355,073	54,545	44,995	41,555	63,017	495	1,888
April	373,203	382,746	48,030	46,102	37,741	60,483	4,156	5,028
May	312,870	394,190	35,510	45,402	32,756	62,357	8,338	12,818
June	245,817	378,575	26,046	40,291	25,205	59,110	7,321	13,494
July	262,903	328,063	28,055	32,837	26,090	46,946	7,500	10,135
August	279,115	345,271	30,200	38,319	28,150	45,958	7,554	10,053
September	288,008	327,542	28,360	35,986	28,670	39,653	7,130	8,463
October	284,574	365,162	32,500	42,236	28,450	37,947	5,750	7,663

Factory shipments and output for the other months of 1923 and 1922 follow:

	Output		Carloads		Driveaways		Boat	
	1924	1923	1924	1923	1924	1923	1924	1923
November	312,996	237,329	38,133	27,232	32,959	27,376	6,413	5,070
December	303,201	228,410	34,984	27,244	27,608	26,743	4,000	1,307

Motor vehicle production segregated as to cars and trucks is as follows:

	1924			1923	
	Cars	Trucks		Cars	Trucks
January	287,353	28,925	January	223,822	19,732
February	336,371	31,156	February	254,782	22,173
March	348,356	34,118	March	319,789	35,284
April	337,045	36,158	April	344,661	38,085
May	279,455	33,415	May	350,460	43,730
June	217,935	27,884	June	337,442	41,173
July	237,668	25,248	July	297,413	30,692
August	251,551	27,510	August	314,431	30,872
September	257,947	30,061	September	298,964	28,578
*October	256,127	28,387	October	335,041	30,139
			November	284,939	28,073
			December	275,472	27,762

*Estimated.

Receiver of Duesenberg to Petition Plant Sales

INDIANAPOLIS, Nov. 3—Receiver Rassmussen of the Duesenberg Automobile & Motors Co., which has been operated by him for several months, is planning to petition the court here this week to set a date for the sale of the property. It is understood that the receiver and interested parties know of several prospective bidders, and the reorganization is one of the possibilities of the proposed sale.

WHEELER IS PAIGE DIRECTOR

DETROIT, Nov. 6 — William A. Wheeler has been elected a vice-president and director of the Paige-Detroit Motor Car Co., filling the vacancy on the board caused by the death of Sherman I. Depew. Mr. Wheeler will also serve as assistant to the president.

In recent years he has been in charge of the manufacturing division of the Paige company. He has been a member of the Paige organization since 1914, his earlier manufacturing experience having been obtained in New England.

Mines Bureau Holds Ethyl Gas No Menace

Report Shows Results of Experiments Covering a Period of Eight Months

NEW YORK, Nov. 1—New York City, Philadelphia and certain New Jersey health authorities have prohibited the sale of gasoline containing tetra-ethyl lead, an action which appears to be somewhat premature in view of the results of tests conducted by the Bureau of Mines, a preliminary report of which has just been issued.

This report states in effect that more than 60 animals, including pigs, guinea pigs, rabbits, dogs and monkeys, were exposed daily for three to six hours to exhaust fumes from an engine using ethyl gas as fuel during a period of eight months. The animals were observed throughout this period for symptoms of lead poisoning such as colic, paralysis, loss of appetite and loss of weight, and analyses of blood as well as the entire tissue of animals killed purposely were made. Concentration of the exhaust in the atmosphere which they breathed was greater than that in city street traffic.

After a period of approximately eight months' daily exposure there was no indication of lead poisoning. The animals continued to grow and mature at normal rate and even gave birth to young which matured normally. Other observations showed that most of the lead in exhaust gases containing it when inhaled again is exhaled.

The investigation indicates seeming remoteness of any danger of undue lead accumulation in streets through the discharging of scale from automobile engines.

It is pointed out that tetra-ethyl lead itself is not an engine fuel, and is sold to the public only in greatly diluted form, commonly less than one part per thousand of gasoline.

Chevrolet Celebrating Thirteenth Anniversary

DETROIT, Nov. 3—Celebrating its thirteenth anniversary in the week beginning today, Chevrolet Motor Co. points to a record of production during this period of 1,744,870 cars and light delivery trucks, the second greatest in the industry. In the last three years the company enjoyed its most extensive development, more than 1,000,000 cars having been produced since Jan. 1, 1922.

In a brief review of its history, the company relates its founding Nov. 3, 1911, with Louis Chevrolet, William H. Little and Edwin R. Campbell as incorporators. The plant at that time was located in Detroit but was moved to Flint in August, 1913. In 1914 Chevrolet plants at Flint and New York were in production on the "Baby Grand" touring car and the "Royal Mail" roadster. In 1915 volume production of the "490" car, so-called because of its price of $490, was begun.

On May 2, 1918, General Motors Corp. purchased all assets and assumed all liabilities of the Chevrolet Motor Co.

The production in 1912 was 2999 vehicles. In 1923 the volume fell a few thousand short of 500,000.

The company today occupies 167 manufacturing buildings. There are 12 plants located at Detroit, Flint, Toledo, Bay City, Buffalo, Tarrytown, Cincinnati, St. Louis, Janesville and Oakland, Cal. Total number of employees is approximately 26,000. The volume of business in 1923 aggregated $229,819,867.

Some of Gray & Davis Activity to Be Moved

SPRINGFIELD, MASS., Nov. 5—One-half of the normal production of the smaller sized generators for starting and lighting, hitherto produced in the Gray & Davis plant in Cambridge, will be transferred to the Springfield plant of the American Bosch Magneto Corp. on Dec. 1, according to Arthur T. Murray, president.

These generators are of the 4-in. size and will mean an increase of $100,000 to $150,000 in monthly production here. Plant facilities here are sufficient to take care of immediate transfers of production with extensive changes or additions, Mr. Murray says. The plant force is being increased to some extent, however.

New products are said to be in preparation that promise to augment the output of the local plant, and it is understood that plans to enter the radio field, which have been under consideration for two years, will soon be brought to realization.

Fitchburg Machine Works Is Moved to Seneca Falls

SENECA FALLS, N. Y., Nov. 3—The entire plant of the Fitchburg Machine Works of Fitchburg, Mass, has been moved to Seneca Falls where it is located in the plant of the Seneca Falls Manufacturing Co. This move follows the purchase last spring of the local concern by the Fitchburg company which since then has been operating the Seneca Falls property as a separate unit. Henceforth the Fitchburg Machine Works will be known as the Seneca Falls Machine Co.

This combines two of the oldest concerns in the machine tool industry, the Fitchburg company having been established in 1864 and the Seneca Falls company in 1879. The former has specialized in building production machinery, including the Lo-swing lathe, while the latter has featured the Star and Seneca Falls engine lathes.

The officers of the company are Marcus A. Coolidge, president and treasurer; Edwin R. Smith, vice-president and general manager and John A. Fyfe, secretary.

18,921 Studebakers Sold Third Quarter

Netted $2,131,409 After Taxes, as Compared with $4,855,079 Last Year

SOUTH BEND, IND., Nov. 3—The Studebaker Corporation reports sales of 18,921 cars in the third quarter and net sales for the period of $22,325,033. Net profits before income taxes were $2,431,980 and after paying the Government the profits amounted to $2,131,409.

This compares with 40,695 cars sold in the corresponding quarter last year, when net sales were $46,372,646 and net profits, $5,486,664. After taxes there was left $4,855,079.

For the first nine months of this year car sales totaled 76,508 in comparison with 122,586 for the corresponding period last year. Net sales reached $93,431,260 as against $139,021,191, and profits after taxes were $9,703,678 as compared with $18,226,254.

In explanation of this Frederick S. Fish, chairman of the board, states that the break in production necessitated by arrangements of plants for the manufacture of the new Studebaker cars is the reason for the lower sales and profits.

"Shipments of the new models, started in August, are now under way in capacity quantities," says Mr. Fish. "Results for the fourth quarter give promise of being highly satisfactory, and will exceed any similar quarter in the corporation's history."

The corporation's consolidated balance sheet is as follows:

Quick Assets	Sept. 30, 1924	Dec. 31, 1923
Cash	$5,813,717	$9,955,791
Sight drafts outstanding	3,291,726	1,685,947
Investments	1,738,812	2,857,217
Net receivables (less reserves)	8,860,123	6,917,225
Inventories	28,522,399	26,674,925
Deferred charges	609,372	529,428
Total	$48,836,151	$48,620,535
Current Liabilities		
Notes payable	$5,000,000	.....
Accounts payable (current)	6,021,034	5,567,418
Reserve for taxes	3,296,048	3,316,808
Reserves — dealers' discount and deposits	461,593	2,588,260
Other payable reserves	1,358,746	2,818,058
Total	$16,137,422	$14,290,546

Oakland Reports Sedan Is Best Selling Model

DETROIT, Oct. 31—Oakland Motor Car Co. reports its landau sedan model leading all others in demand, despite the fact that it is the highest priced model in the line. As reason for this the company has word from its dealers that many buyers are taking this car as a companion car for higher priced vehicles, the special appointments meeting the requirements of this class of buyer.

G. M. Third Quarter Better Than Second

Common Stock Earned $8,443,822 as Against $7,771,464 Reported Year Ago

NEW YORK, Nov. 3—Returns from the third quarter show a more profitable business for the General Motors Corporation than in the second quarter, and the three months ending Sept. 30 were better than in the corresponding period in 1923. As a result the common stock has earned $8,443,822 as compared with $7,771,464 in the third quarter last year.

In a nutshell, net sales for the period totaled $140,335,631 as against $148,459,332, while net profits increased from $11,974,509 a year ago to $12,594,873. Net income was $10,505,868 compared with $9,570,452.

For the nine months of this year net sales were $454,762,305 compared with $511,278,685; net profits, $45,906,009 compared with $63,080,647 and net income, $37,787,477 compared with $51,312,321. Common stock earnings were $32,048,652 compared with $45,950,968.

Statement of Earnings

In a statement accompanying the report General Motors says:

The net earnings of General Motors Corp. during the third quarter of 1924 were $10,349,423; after deducting preferred dividends there remained $8,443,822 for the common stock.

The corporation's statement as usual reflects the earnings of the Fisher Body Corp. and General Motors Acceptance Corp. only to the extent of dividends received. If the General Motors Corp.'s equity in the undivided profits of these two companies were included the amount earned on the common stock for the quarter would be increased to $9,423,408.

Earnings for the nine months ended Sept. 30 aggregate $37,416,413, and after the payment of the preferred and debenture stock dividends there remained $32,048,652 earned on the common stock, out of which there were paid three quarterly dividends of thirty cents per share each, aggregating $18,579,281, leaving a balance of $13,469,371 over and above dividends, which has been added to surplus. There has also been an increase in surplus of $4,750,490 by reason of the payment of $10 per share received from the 6 per cent preferred and debenture stockholders who have exchanged their shares for shares of new 7 per cent preferred stock, authorized by charter amendments adopted on June 16, 1924.

It will be noted that the corporation's surplus account as of Sept. 30 of $87,303,168 compares with a surplus of $120,699,299 as of Dec. 31, 1923. The reduction in surplus is due to the fact that the corporation's recapitalization plan as provided in charter amendments adopted by the stockholders at special meeting held June 16, 1924, provided that $51,615,992 of the corporation's surplus should be capitalized; this was done and is reflected in the corporation's statement which shows common stock as of Sept. 30, 1924, at $258,079,962 as against $206,463,970 as of Dec. 31, 1923; the increase of $51,615,992 corresponding to the decrease of like amount shown in surplus account.

The physical properties of the corporation are in splendid condition and the balance sheet attests better than words the excellent cash and working asset position, and reflects the effectiveness of the new method of inventory control.

The condensed balance sheet shows the following current assets and liabilities:

	Sept. 30, 1924	Dec. 31, 1923
Current Assets		
Cash in banks and on hand	$70,205,649	$47,069,804
Marketable securities	9,094	9,817
Sight drafts with B/L attached and C.O.D.	12,989,687	13,283,706
Notes receivable	3,674,225	3,452,273
Accounts receivable and trade acceptances	14,100,563	15,820,019
Inventories at cost or market, whichever is lower	104,402,630	138,678,131
Prepaid expenses	1,865,307	1,587,532
Total	$207,247,158	$219,901,286
Current Liabilities		
Accounts payable	$21,754,830	$40,299,518
Notes payable	.....	10,000,000
Taxes, payrolls and sundries accrued not due	18,332,149	19,430,546
Federal taxes	6,964,650	8,272,586
Accrued dividends on debenture and preferred stock	1,233,215	1,148,054
Total	$48,284,846	$79,150,704

PRESTON MOTORS SOLD

BIRMINGHAM, ALA., Nov. 3—Announcement has been made of the sale of Preston Motors Corp. properties to A. M. Konkle, representing a group of Birmingham business men. Mr. Konkle announces that the plant will be remodeled for other manufacturing enterprises.

GENERAL MOTORS REPORTS SUBSTANTIAL PROGRESS IN ITS POLICY AGAINST OVER-STOCKING

NEW YORK, Nov. 4—Referring to the new policies of the corporation to make production keep pace with demand and not to overstock dealers, the report of the General Motors Corp. for the third quarter says:

"In the absence of any data on sales of automobiles to consumers by the industry as a whole, the experience of General Motors is suggestive. During the nine months of 1924 deliveries of General Motors cars to ultimate consumers totaled 534,294, or 7.6 per cent less than the 588,137 delivered in the corresponding period of the peak year of 1923 and 73.6 per cent more than the 313,000 delivered in the same months in 1922.

"In line with the policy of the corporation adopted early in the year, curtailed production was continued through the third quarter in order to establish permanently healthy and sound conditions in the industry and particularly among dealers and distributors. This policy, of course, results in lower earnings than otherwise would obtain during the period of adjustment, and is reflected in the sales of the corporation to its dealers during the third quarter of 141,128 cars and trucks, as against sales to consumers by our dealer organization of 163,704 units during the same period.

"For nine months sales of the corporation to dealers were 494,227 units, compared with 543,294 units delivered by dealers to consumers. The curtailment of production represented by the excess of deliveries by the dealers to the public over the corporation's sales to its dealers thus amounted to 22,576 cars and trucks for the third quarter and 49,067 for the nine months.

"From the above it will be seen that substantial progress has been made in the direction of stabilizing the dealer and distributor organization, and this policy will be continued to such extent as is necessary to fully and completely establish the new scheme of relationship with its distributors and dealers, under which General Motors dealers and distributors will not be forced or required to buy and stock cars beyond that number which a reasonably prudent business man would judge necessary to properly care for and meet the demands of the business during the current period."

Railroad Will Study Use of Motor Truck

NEW YORK, Nov. 5—The Boston & Maine Railroad has established a department to study the subject of motor truck and bus transportation to determine if it should augment its rail service with motor vehicles.

President J. H. Hustis declares that the inroads of motor competition in his road's territory have been constantly growing and have reached a stage where the railroad must determine what its future attitude toward this competition is to be.

Mr. Hustis says:

The question in some sections is whether the railroad or motor truck can best serve the territory. It is apparent that in certain fields both instrumentalities of transportation cannot be continued and that either one or the other must prevail. The railroads cannot continue to contribute toward the building of highways and their upkeep in order to subsidize a form of transportation which is sapping railroad revenues, and, in the case of some branch lines, reducing them almost to the vanishing point.

This situation is not peculiar to the Boston & Maine, but the fact that in much of the territory which it serves its lines are paralleled by highways especially adapted to motor transportation makes the Boston & Maine particularly susceptible to the inroads of this form of competition, both public and private, and in both passenger and freight service. The problem is not necessarily one of competition but involves the elimination of expensive duplication and the adjustment of both forms of transportation to a logical and permanent basis.

MEN OF THE INDUSTRY

Hazard Is Davis Factory Head

Lee H. Hazard, formerly production manager of the Velie Motors Corporation, has been appointed factory manager for the Davis Motor Car Co. of Richmond, Ind. Mr. Hazard was with the Velie organization for 15 years. He is a graduate of the University of Illinois, College of Engineering.

John Wilkinson Resigns

John Wilkinson, chief engineer of the H. H. Franklin Manufacturing Co. and one of the pioneers in the development of the air-cooled automobile engine, has severed his connection with the company. Mr. Wilkinson is vice-president and director of Franklin, and may resign from these posts at the next annual meeting of the company. He is a large stockholder. It is understood that he intends to take a long needed rest after many years of experimental labor in the production of the air-cooled car.

Sinsabaugh with American Motorist

C. G. Sinsabaugh, long identified with automotive publications and for several years news editor of the Class Journal Co., has been appointed managing editor of the *American Motorist*, official organ of the American Automobile Association. At one time Mr. Sinsabaugh was editor of *Motor Age*, later being associated with *Motor* and *Motor Life* in the same capacity.

William Campbell on Visit Here

William Campbell, automobile representative, Johannesburg, Union of South Africa, is on one of his numerous visits to America for the purpose of establishing further relationships with the motor industry. Mr. Campbell has represented American motor lines since the inception of the industry, and has an organization that covers not only the entire Union of South Africa, but Rhodesia, and British South Africa.

Askin Handles Division Sales

T. B. H. Askin has been appointed sales manager for the intermountain division of the American Manganese Steel Co. of Chicago Heights, Ill. He will make his headquarters in Denver.

Mooney with D'Arcy

Frank J. Mooney, formerly of MacManus, Inc., and the Critchfield Co. branch at Detroit, and at one time advertising and sales manager of the Hupp Motor Car Co., is now with the D'Arcy Advertising Co. of St. Louis.

Tibbetts to Help Patent Work

Milton Tibbetts of Detroit, assistant secretary of the Packard Motor Car Co., has been named assistant to A. J. Brosseau, a director of the National Automobile Chamber of Commerce, in connection with the simplification of the work of the United States patent office, of which Mr. Brosseau is a member of the committee appointed by Secretary of Interior Work. Mr. Tibbetts and Mr. Brosseau will represent in addition to the automobile industry the engineering field in other industries.

Chrysler Bringing Out $3,725 Town Car Model

DETROIT, Nov. 3—The Chrysler Motor Corp. has brought out a town car priced at $3,725. The body is by Fisher and five color options are offered. It is mounted on a 118¾-in. wheelbase chassis which does not differ in other respects from the standard.

The inclosure is upholstered in broadcloth with broad lace paneling on rear of front seat and on the doors. The driver's seat is upholstered in leather and top of rear quarters are also covered with this material. Landau irons are fitted.

Natural wood wheels striped to match the body finish are regular equipment. Two taxicab seats are provided in the back of the front seat and each car is finished with a robe of curled silk, faced on one side to match the upholstery.

Regular equipment includes front bumper, rear fender guards, scuff plates, bullet head and side lamps, automatic windshield cleaner, clock, autophone, vanity and smoking sets, silk curtains and rubber mat to protect carpet in inclosure in wet weather. The large glass panel at the rear of the driver and the door windows are controlled by crank regulators.

Fisher Making Bodies for Chrysler Models

DETROIT, Nov. 6—Chrysler standard, imperial and crown imperial sedans and the royal coupé bodies are now being built by the Fisher Body Corp. Externally the new bodies are substantially the same but the interior finish has been improved by the use of walnut woodwork and paneling with hollywood inlay. Rear quarter panels on the standard sedan are now metal instead of fabric. The Fisher VV, one-piece, sliding windshield with automatic cleaner is regular equipment on these bodies.

Stewart Manufacturing New Sedan Type of Bus

BUFFALO, Nov. 5—A sedan type bus, known as the Stewart Highway sedan, now is being manufactured by the Stewart Motor Corp. of this city. This vehicle comprises an 18-passenger body with five transverse seats upholstered in leather, mounted on the Stewart 1½-ton, 160-in. wheelbase speed truck chassis. There are four entrance doors on the right side and one on the left.

Equipment includes 32 x 6 in. pneumatic tires, nickel-plated radiator and lamps, front bumper, four Houdaille shock absorbers, window regulators, heater, etc. The complete bus sells for $3,650, plus tax.

Tire Makers Expect No Output Reduction

Majority Disagree with Firestone That Production Is Exceeding Demand

AKRON, Nov. 3—Although the Firestone Tire & Rubber Co. recently announced in a statement to dealers that tire production is exceeding consumption, thus causing an unwarranted rise in the cost of crude rubber, officials of several large rubber companies declared this week that they expect no general curtailment in output of tires. They do not agree with Harvey S. Firestone that the demand from automobile makers and tire retailers is running far behind present manufacturing schedules.

Orders coming in now justify a continuation of the current production ticket of approximately 22,000 tires a day, according to an official of the B. F. Goodrich Co.

Output Down 12 Per Cent

This official explained that the output of tires has decreased about 12 per cent in the last few weeks, as previously announced from unofficial sources, but he attributed this largely to the fact that dealers have delayed buying to take advantage of spring dating credits.

Goodrich reached a high record of tire production recently of 25,000 tires a day, compared with 18,000 early in the summer.

It is estimated that the decline in tire production for the entire Akron district has not been more than 10 or 12 per cent. Between 85,000 and 90,000 tires a day are now being manufactured, compared with 100,000 a few weeks ago.

Just as the rainy season in the spring adversely affected tire sales, the continued good weather has proved a factor in boosting the tire business during October, according to sales managers of the Akron factories. Most companies are selling more tires than they did the same month a year ago.

No Cut with Miller

Officials of the Miller Rubber Co. said no general curtailment of tire production is contemplated at that plant. The factory's decline from peak production has not been more than 10 or 12 per cent, it was asserted.

The larger factories here continue to operate on a basis of three shifts a day, but working forces have been somewhat reduced. The Akron plant of the Kelly-Springfield Tire & Rubber Co. and several of the smaller plants have laid off most of the workers employed on their third shifts.

Surplus labor, which the rubber companies cannot use at present, is being used on outside construction work, which has been unusually heavy this year, according to the State-city employment service.

Meachem Gear Corp. to Stop Operating

Plant Will Be Closed as Soon as Present Unfilled Orders Are Disposed Of

SYRACUSE, N. Y., Nov. 5—Announcement is made by officers of the Meachem Gear Corp. that the company has decided to discontinue business and the factory here will be closed within a month or as soon as unfilled orders are disposed of.

The company is not involved in any financial troubles, nor has it been sold to any other concern. "We have decided to close the plant for reasons of our own," T. Goldsboroug Meachem, president of the corporation, declared. "No financial difficulties are involved. We have arranged to dispose of the lease of the building which we occupy. The machinery, which we own, will be sold and eventually the company liquidated."

Decision to close the plant and discontinue the company came as a distinct surprise to business circles. Only recently the company moved from smaller quarters at 411 Canal Street, leased the building on Dickerson Street, purchased much new machinery and prepared to increase production.

Meachem a Pioneer Family

The withdrawal of the Meachem family from the gear business marks the passing of one of the pioneer families in this industry. Thomas W. Meachem, father of the two owners of the Meachem Gear Corp., established the New Process Gear Co., making rawhide gears. This was sold to John N. Willys. At that time the Meachem Bros. agreed not to manufacture bevel gears for a period of five years.

The Meachem Gear Corp. was organized in 1917 with a capital of $250,000 to handle the manufacture of rawhide gears for factory purposes. The company decided to re-enter the automotive field when it leased the building which it now has.

Neither T. Goldsborough Meachem nor his brother, J. F. Sabine Meachem, gave any reason for the decision to discontinue business, nor have they any plans for any further activity for themselves.

Union Body Organized by Toledo Interests

TOLEDO, Nov. 5—The Union Body Co. has been incorporated here to manufacture a new line of combination bodies. General offices of the company will be in this city, and a plant has been obtained at Sandusky.

Wesley Thornburgh and Burton K. Blanchet, formerly in the municipal bond business in this city, are leaders in the formation of the new concern, which has an authorized capital of 10,000 no par common shares and $500,000 of preferred stock.

Business in Brief

Written exclusively for AUTOMOTIVE INDUSTRIES *by the Guaranty Trust Co., second largest bank in America.*

NEW YORK, Nov. 3—The pre-election apathy, intensified by continued warm weather, still dominates current business movements. Week-to-week changes are small and inconclusive. The outlook, however, is generally regarded as favorable, especially in the Middle West, where good crop weather and large grain marketings and exports at high prices have stimulated optimism.

Car loadings in the week ended Oct. 18 reached a new high record for all time, numbering 1,102,336 cars as against 1,088,462 in the preceding week and 1,073,095 in the corresponding period a year ago. The previous high record was 1,097,493 cars, reached in the last week of September, 1923.

Net operating income of the Class 1 railroads in September was $116,718,000, the largest reported since July, 1918. This represents an annual return of 5.60 per cent on the tentative valuation of the roads comparing with 4.40 per cent in September last year. The large September earnings reflect important economies in operating expenses, gross revenues being somewhat smaller than a year ago.

Department store sales in the second Federal Reserve district in September, according to the agent at New York, were larger than those of a year ago, average daily sales showing a gain of 4 per cent. Sales of leading mail order houses were 44 per cent larger than in August and 17 per cent larger than in September, 1923.

Revised figures of foreign trade for September show a large increase in exports of raw foodstuffs and animals and a marked growth in imports of raw material for use in manufacture. Smaller increases appeared in both exports and imports of manufactured and partly manufactured goods.

Domestic production of crude petroleum in September amounted to 59,635,000 barrels, comparing with 61,704,000 in August, while domestic consumption was 56,606,000 barrels, as against 54,934,000 in the preceding month. The increase in stocks during the month was only 715,000 barrels, the smallest since last January, when a slight decrease was reported.

Ohio Body Perfects Reorganization Plan

New Company Will Be Formed to Take Over Holdings, If Stockholders Approve

NEW YORK, Nov. 5—Under the reorganization plans of the Ohio Body & Blower Co., it is proposed to fund the bank indebtedness of $1,865,000 for 15 years and obtain $700,000 additional cash to take up the land contract of the company and repay current banking obligations. In accepting the securities they would receive for the old debt, banks agree to waive the interest for the last two years.

The company would transfer to the Ohio Body Co., its subsidiary, all current assets, not including stock in the Swartout Co., together with $70,000 in cash and assumed current bank debt of the Ohio Body Co., amounting to $275,000. In return the Ohio Body Co. is to assume liabilities of the present company, with the exception of the old bank debt and the land contract.

A new company would be formed, to be known as Ohio Body & Blower, Inc., to which the Ohio Body & Blower Co. proposes to sell land, buildings, machinery and equipment, together with holdings of the Swartout company and the entire capital stock of the Ohio Body Co. for $2,565,000 of Class A, B and C debentures, and 110,254 shares of no par value common stock. The Class A debentures would bear 6 per cent interest, and the Class B and C debentures, 7 per cent interest, starting Oct. 1, 1926.

Bankers Make Agreement

Bankers have agreed to accept the debentures on the three classes of stock and 100,000 shares in exchange for the cancellation of the bank indebtedness of $1,865,000 and $700,000 in cash. The additional 10,254 shares of common stock not taken by the bankers would be used for a liquidating dividend to present stockholders of the Ohio Body & Blower Co. on the basis of one share of the new for every 10 shares of the old. Stockholders would receive the right to subscribe to the Class A debentures at par and accrued interest, and would receive as a bonus one share of the common stock for each $7 par value of the Class A debentures purchased.

Stockholders will meet Nov. 14 to vote on the plan.

Fiat Reported Planning to Double Its Capital

WASHINGTON, Nov. 4—Cabled advices to the Department of Commerce state that Rome, Italy, newspapers carried on Nov. 1 a story to the effect that the existing capital stock of the Fiat Motor Company, now 200,000,000 lire, is to be doubled, the capitalization of the company to be made 400,000,000 lire.

Officers Reelected by Ford of Canada

Incident to Election, Edsel Ford Pays High Tribute to Company Executives

FORD CITY, ONT., Nov. 5—Officials of Ford Motor Co. of Canada, Ltd., were all returned to office at the annual stockholders meeting held this week. Edsel B. Ford, president of the Ford Motor Co. of the United States, paid the Canadian executives high tribute for the able manner in which the affairs of the company have been administered and spoke of the splendid relations between the Canadian and American companies.

The continuing officers are Henry Ford, president; Wallace R. Campbell, first vice-president and treasurer; Edsel B. Ford, second vice-president; George E. Deckert, third vice-president; P. W. Grandjean, secretary and assistant treasurer; D. B. Greig, assistant secretary, and E. C. Kanzler, director.

Mr. Campbell told of the formation of the new Australian subsidiary company and outlined the plan as recently announced.

Issuance to the public of fractional shares of the stock of the Canadian company, as practised by some American brokers, was condemned.

Adopts Used Car Plan

FORD CITY, ONT., Nov. 5—Ford Motor Co. of Canada, Ltd., has a used car plan which it has worked out with its dealers, which has now been in operation several months and which the company finds to be very successful. The main purpose of the plan is to bring used Ford buyers to the regular Ford dealer establishments, accomplishing this by an educational campaign in used car values.

The plan is similar in some respects to other used car plans which have been operated by dealers in certain localities, principally in that it assesses the original owner for cost of reconditioning and also fixes a brokerage fee which the dealer gets for handling the sale.

The plan brings, or seeks to bring, the used Ford buyer to the regular dealer by declaring that values can only be guaranteed by these dealers under a plan worked out by the company. The dealer for his part is obliged to take cars in only at real market value, recondition them and then guarantee them to be in a certain definite condition. If buyers are dissatisfied with the car after a period of use, they are permitted to return them and to take another used car or new car, full allowance being made of the former car purchase price.

The company's part in the plan consists in that it originated it after studying market conditions generally in the Canadian provinces, and recommends it to all its dealers. It provides seals and other incidentals to the carrying out of the plan, the seals being guarantees of the genuineness of the condition and acting as a guarantee generally for satisfactory performance. The company also provides its dealers with booklets describing the plan for circulation to prospective used Ford buyers.

The plan, while adopted to meet used car conditions in Canada, is available for all dealers supplied by the Ford Canadian company in any country in which there are used car difficulties.

40 Per Cent Hupp Buyers Previously Had Owned Car

DETROIT, Nov 5—Figures compiled by the Hupp Motor Car Corp. on retail domestic sales in the first eight months of the year, show 22.5 per cent of the total number to have been clean deals. More than 40 per cent of all cars sold went to former owners of Hupmobiles and nearly 34 per cent of all sales involved the trade-in of a used Hupmobile.

More merchants and manufacturers bought Hupmobiles than any other class of buyer. Salesmen were second, professional men third and contractors and builders fourth. Women buyers ranked fifth. More women bought Hupmobiles during this period than did physicians and farmers, the company declares, and these two latter classes have for years been heavy buyers.

Nearly 8 per cent of all cars traded in were cars selling at more than the Hupmobile class. Previous owners of lower priced cars were the largest class of buyers recruited from ranks of owners of other makes.

Shipments Made of Tires Gained in Third Quarter

NEW YORK, Nov. 3—A brisk pick-up in the tire business is indicated in the summary of replies to the questionnaire sent out by the Rubber Association of America covering operations in the third quarter. With practically all of the big producers but Firestone reporting, the statistics show that the value of shipments of automotive products in the third quarter was $170,603,000 in comparison with $139,899,000 in the second quarter and $130,562,000 in the corresponding period, last year.

Tire shipments in the third quarter were valued at $132,316,000 as against $109,903,000 in the second quarter and $100,707,000 in the third period last year. Tube shipments were $25,549,000 and solids $7,457,000.

The inventory of crude rubber shows a grand total of 49,645,000 long tons on hand on Sept. 30 and 50,760,000 long tons afloat.

CHARLES WILLARD YOUNG DEAD

NEW YORK, Nov. 3—Charles Willard Young, president of the Kelly-Springfield Motor Truck Co., is dead of pneumonia. Mr. Young also was a member of the banking firm of Emerson, McMillin & Co. and a director of several other corporations. Mr. Young was 47 years of age and resided at Bronxville, N. Y.

Packard's Net Profit Placed at $4,805,174

Declines from Previous Year—Sales During Year Amounted to $46,003,679

DETROIT, Nov. 1—Net earnings by Packard Motor Car Co. during the fiscal year ended Aug. 31 were $4,805,174, which compares with earnings of $7,081,878 the year previous. Sales during the year totaled $46,003,679, a reduction from $55,670,464 in 1923. The comparatively slight decrease in earnings as compared with the reduction in sales volume is ascribed to greater manufacturing and distributing efficiency.

Company assets show current assets aggregating $31,348,572, of which $15,652,833 is in cash and United States Treasury notes. The cash position remains approximately as at the start of the year. Current assets are over eight and one-half times current liabilities, and total assets seven and one-half times total liabilities. Surplus of $9,488,442 is increased over $8,676,023, the previous year's total.

The company paid cash dividends on common stock during the year of $2,852,424, or 12 per cent, and in addition an extra cash dividend of 3 per cent. Dividends on preferred stock were at the regular quarterly rate of 1¾ per cent, the year marking sixty consecutive payments on this stock since it was first marketed. Preferred stock was reduced from $14,676,200 to $11,704,300.

Referring to the operation of distributing branches by the company, President Alvan Macauley, said:

"It will be noted that, as usual, the distributing branches of the company showed a substantial profit, amounting to $1,401,109. There has long been a theory in automobile circles that branch houses do not pay. We have not found this so. We have branches at New York, Chicago and Detroit. These have not only been profitable to the extent noted, but, being well organized and managed, they have been, and will continue to be, a source of great strength to the company."

Huebotter Will Address Indiana Section S. A. E.

INDIANAPOLIS, Nov. 3—The November meeting of the Indiana Section of the Society of Automotive Engineers will be held Nov. 13 in the Hotel Severn and will be addressed by H. A. Huebotter, research engineer of the engineering experimental station of Purdue University.

"The Flow of Heat from Piston Barrels to the Cylinder Walls" will be the subject, and results of experiments as well as of other analysis will be given. The research work was done in connection with Prof. G. A. Young, head of the School of Mechanical Engineering of Purdue.

Ford Launches Plan for Ocean Shipping

Starts Two Boats in Service Which May Be Beginning of Regular Lines

DETROIT, Nov. 3—The starting of two boats in ocean service by the Ford Motor Co. marks the beginning of an experiment in ocean shipping, which if proved successful is expected to result in the establishment of regular steamer lines to many of the leading ports of the globe.

The point upon which the experiment will be adjudged successful is whether the company by operating its own steamers can land automobiles at foreign ports at a lower freight cost than by shipping over the present established lines.

Fleet of Ships Likely

If Ford steamers can carry automobile parts to various foreign destinations at lower cost than other lines it is regarded as practically certain that a fleet of vessels will be started in operation within the near future, sailing to all ports at which Ford plants are located.

The plan of operating his own vessels and thereby getting automobiles to foreign plants at the lowest possible rate has long been under consideration by Henry Ford. The first steps toward trying out the possibilities of this development are now being made.

Two Ford vessels, the Onondaga and the Oneida, twin steamers, are being shipped through the Welland Canal to Montreal, from where they will sail under full cargo of Ford parts exclusively, the first to Buenos Aires, the second to coastwise points in the southern part of the United States. On making the first trip they will carry return cargoes to Norfolk, Va., from which point they will do all their clearing in the future.

The Norfolk plant is one of the newest of the Ford assembly branches in the United States. It is located on the Elizabeth river, which flows into Hampton Roads, and has ample facilities for discharging cargoes and loading ocean-going vessels. The plant is served directly from the main plants here by several of the southern railroads which connect with the Ford owned Detroit, Toledo & Ironton Railroad.

Center May Be at Norfolk

The Norfolk plant will loom as the probable center of Ford exporting activities should the plan as at present outlined be carried through. This, however, is by no means certain, as Philadelphia, Baltimore and Newport News also offer possibilities because of the interconnection of railroads serving these ports with the D. T. & I.

Because of the savings in freight rates which the company is able to make by shipping over its own railroad line, all of these southern ports have been getting a large part of the export business. There is a freight saving of three cents per hundred by shipping via Baltimore, Norfolk and Newport News instead of New York, and there is a savings of 2 cents a hundred by shipping via Philadelphia.

Furthermore, the shipping of export cargoes out of the southern ports makes possible the greatest haul over the D. T. & I. and as this is a company road, it desires that the railroad should get as much of the company shipping as can be handled. Thus export shipments will leave the Highland Park and River Rouge plants over the D. T. & I., will be carried as far as possible on this line and then routed to Atlantic ports over the B. & O., C. & O., or other southern lines.

Savings thus made in the inland freight is expected to be increased by savings in ocean freight, thus permitting the landing of cars in foreign ports at a lower figure than would be possible if the company were shipping over outside rail and steamship lines. By making delivery prices lower it is expected the market for cars will be increased.

The success of the steamship experiment hinges upon the ability to reduce car delivery prices abroad. Under the Ford policy these steamers must carry their cargoes at a lower cost than the regular lines are able to do and must show a profit based upon the investment. The company does not propose carrying the cargoes at cost but at cost plus a reasonable return.

An important contingency in connection with the operation of company owned lines is the ability to arrange for regular return cargoes. This it expects can be provided for through officials of the various export branches. At Buenos Aires, where the first foreign cargo will be carried in a company owned boat, of-

(*Continued on page* 832)

Kokomo Rubber Planning Greater Output in 1925

KOKOMO, IND., Nov. 3—After a period of nine months of continuous night and day production, plans were laid for increased production next year at the semi-annual sales conference of the Kokomo Rubber Co. held here. Additional plant equipment is being installed which will add approximately one-third more space to capacity, according to Randolph Mitchell, general manager. Mr. Mitchell stated that the first three-quarters of 1924 set a new record for the period both as to volume business and profits.

The conference was attended by all the company's wholesale representatives, with Carl B. Gibson, sales manager, in charge. Salesmen reported a steady betterment of tire sales in all parts of the country. While dealer buying is still on a conservative basis the salesmen reported consistent gains in volume. Dating business is starting much stronger than last year, company officials announced.

R & V Closes Doors After Long Career

Passes Out of Existence with Shutting Up of Main Office in East Moline

EAST MOLINE, ILL., Nov. 1—The R & V Motor Co. passed out of existence today with the closing of the main office at Fifteenth Avenue and Sixth Street. Assignment of the assets of the firm has been made to the Moline Body Corp., one of the largest creditors of the manufacturing enterprise, which at one time was the outstanding industrial plant in the community. The Moline assignees have taken over part of the office force to continue collections and take charge of the distribution to other creditors.

H. A. Holder, who has been president since the firm was reorganized a few years ago, has returned to Richardson & Hill, Boston packers, with whom he was associated before his East Moline assignment. E. E. Fratcher, treasurer, has made no plans for the future.

Service Company Organized

The Knight Motor Parts Co. of East Moline has been organized and is now operating in the service building at Seventh Street and Fourteenth Avenue for the service of R & V car owners. Dan Smith, a veteran of the R & V organization, is in charge of the motor parts company. The office building was sold some time ago to the J. L. Brady Plumbing Co. All stock and material of the company have been exhausted, although the company retains its patent rights, dies, etc., and it is reported that the firm has under consideration proposal to manufacture the engine and sell it for other car power unit.

The R & V organization has had a long and interesting career. It was founded a quarter of a century ago by W. H. VanderVoort and O. J. Root and began in a small way with limited capital, producing gasoline engines. The plant held some of the first French ammunition contracts in this country and later produced navy guns for the United States. Afterward it tried unsuccessfully to carry the debt of the war-time expansion on the automobile production revenue.

Premier Concentrates on Cabs; Drops Cars

INDIANAPOLIS, Nov. 3—The Premier Motors Corporation, which for about a year and a half has been engaged in the manufacture and sale of Premier taxicabs as well as Premier passenger cars, has abandoned the production of passenger cars to concentrate on the making of taxicabs.

At present the production of Premier taxicabs is averaging 150 a month.

Company to Finance Sale of Studebakers

Industrial Acceptance Corp. Is Organized with Arthur J. Morris at Head

NEW YORK, Nov. 3—The Industrial Acceptance Corp. has been formed to take over and continue the business of financing sales of Studebaker cars from factory to dealer and from dealer to consumer. In addition to its wholesale and retail plan, a modified retail plan has been worked out to apply to special conditions and requirements of the farmer.

Arthur J. Morris, who began this business more than five years ago, will be president, and the staff that has been associated with him will continue the activities of the new corporation. Corporation activities will be conducted along lines followed by other large motor acceptance organizations.

At the present time financing of Studebaker automobiles is at the rate of 60,000 cars a year. The volume of business to be taken over by the new company amounted to more than $622,000,000 in the year ended July 31, 1924. Transactions financed in the preceding year exceeded $26,000,000.

Acceptances of dealers, of which all except a small percentage mature in three months or more, are issued for not more than 80 per cent of the wholesale price of the cars, and the notes of retail purchasers, which mature in installments over not more than 12 months, are issued for not more than two-thirds of the cost of the cars.

Substantially all of the company's borrowings will be effected through the issue of collateral trust gold notes, secured by the deposit with a trustee of notes and acceptances of dealers and retail purchasers.

White Forms Subsidiary for Financing of Sales

CLEVELAND, Nov. 3—The White Motor Securities Corp. has been formed as a subsidiary of the White Motor Co., to finance installment sales of White trucks. The new company will have an authorized capital of $5,000,000 (50,000 shares) of preferred and 25,000 shares of no par common stock.

The preferred stock will be 7 per cent cumulative non-voting, callable at 105, and guaranteed as to principal and dividends by the White Motor Co. Only $2,500,000 of this stock will be issued now. It will be offered at par to stockholders of the White Motor Co. of record Nov. 12.

RAILWAY BUYS BUS LINE

INDIANAPOLIS, Nov. 3—The Indiana Motor Coach Co., which for a little more than two years has operated buses between here and Greenfield and Richmond, has been sold to the Terre Haute, Indianapolis & Eastern Traction Co., which operates between Terre Haute and Richmond. By the sale 18 buses and equipment of the principal independent bus company of this section passes to the traction line.

FINANCIAL NOTES

Mullins Body Corp. for the nine months ended Sept. 30 shows net profit of $251,105 after charges, which is equivalent to $1.93 a share earned on 100,000 no par common shares. In the corresponding period of last year, the net profit amounted to $112,665 or 54 cents a share. For the quarter ended Sept. 30, net profit totaled $44,411, or 25 cents a share on the common, after preferred dividends, as compared with $11,879, or $1.22 a share on the outstanding $970,000 preferred stock in the third quarter of last year. Current assets shows accounts receivable of $329,265 and notes receivable, $38,767. Current liabilities show notes payable of $150,000 and accounts payable, $96,271.

Mack Trucks, Inc., reports for the third quarter of this year net profits of $1,345,321 after deductions of charges for depreciation, maintenance, repairs and estimated Federal taxes. This is equivalent to $3.75 a share on the common stock and compares with $1,825,770 for the corresponding quarter of last year, or $5.44 a share.

Reynolds Spring Co. and its subsidiary, the General Leather Co., report net income for the quarter ended Sept. 30 of $67,600. Net income for the first nine months of the year was $233,806 after depreciation and taxes, compared with $250,785 in the corresponding period of 1923.

Eaton Axle & Spring Co. reports a deficit of $35,153 for the third quarter, after the usual deductions. This compares with a profit of $135,357 in the preceding quarter. For the nine months the net profit totaled $212,508.

Timken Roller Bearing Co. has declared an extra dividend of 25 cents and the regular quarterly dividend of 75 cents a share, payable Dec. 5 to stock of record Nov. 18.

A. O. Smith Corp. has declared the regular quarterly dividend of 25 cents on common and $1.75 on preferred, both payable Nov. 15 to stock of record Nov. 1.

White Motor Co. has declared the regular quarterly dividend of $1, payable Dec. 31 to stock of record Dec. 20.

Rolland-Pilain Adopts Brake System of Perrot

PARIS, Oct. 24 (*by mail*) — Perrot front wheel brakes have been adopted by the Rolland-Pilain company of Tours.

It is pointed out by the Henri Perrot Brake Co. that both Peugeot and Delahaye continue to use the Perrot front wheel brake. The Peugeot company, in redesigning its 10-hp. car, is making use of a new type of axle with its own brake, but is using Perrot system on all other models and has just decided, after long comparative tests, to apply the Perrot-Farman self wrapping type of front brake to its 12 and 18-hp. models. Delahaye is using the Adex type brake on one model, and Perrot on all others.

MILWAUKEE CAR CENSUS

MILWAUKEE, Nov. 3—An increase of 6994 passenger cars and a decrease of 1215 horses in the city of Milwaukee in the past year is the result of a survey made on the basis of the statistics collected by the city tax commissioner for personal property assessment purposes. The census was taken as of May 1.

No Tire Price Cuts Looked for in 1925

Statement by Firestone Taken to Point to Stability During Next Year

AKRON, Nov. 3—The statement of the Firestone Tire & Rubber Co. that "Stability should be the keynote of the industry in 1925" is taken to mean by officials of some of the other rubber companies here that there will be no more price cutting of tires.

Unless Firestone takes the initiative, it is regarded as almost certain that the present price level for tires will remain the same for some time to come. Other manufacturers are unanimous in declaring that tires are at the lowest possible price now, in view of the unusually high cost of crude rubber.

Harvey S. Firestone, who for several years has been urging that America produce its own rubber, blames the British Rubber Restriction Act for the recent sensational rise in crude rubber from 18 cents to around 33 cents a pound. He is of the opinion, however, that the increase in production by independent growers, outside of British territory, will tend to remedy the situation.

Overland Coupe Sedan Reduced $100 in Price

DETROIT, Nov. 5—A reduction of $100 in the price of the Overland coupe sedan makes it the lowest priced five-passenger closed model on the market. The new list is $585. The exterior finish is now dark blue instead of black.

Fleet of Buses Equipped with Firestone Balloons

AKRON, Nov. 5—The first attempt to use balloon tires exclusively on a large bus fleet has been successfully tried out on the bus line between Dallas, Tex., and Greenville, it was announced by the sales department of the Firestone Tire & Rubber Co.

The fleet is made up of 12-passenger Reo buses, equipped with Firestone full-size balloon tires. Two round trips are made every day, the distance between the two cities being 53.5 miles. The company's business since Aug. 1, when the fleet began operations, has increased to an extent that more cars are to be added, and several neighboring towns given the service. The tires have gone over the route daily since Aug. 1, without showing wear, it is stated.

FORD'S OCTOBER OUTPUT

DETROIT, Nov. 3—Preliminary figures on the October output of the domestic plants of the Ford Motor Co. are reported at 147,415 cars and trucks, compared with 149,906 in September and 140,370 in August.

METAL MARKETS

With the elections out of the way, the actual extent of the demand should become more of a governing factor in the steel market. While during the days immediately preceding decision of the political issues there was no slackening in the rate at which steel had been bought for some time, and, in fact, aside from a few freak contracts that carried cancellation clauses in the remote event of the election of a certain candidate, the movement of the steel market was singularly free from political influences, the feeling persisted, nevertheless, that the uncertainty of the political outlook restrained more liberal commitments.

It will be seen in the course of this month whether this market sentiment was founded on facts. Sales managers in close touch with automotive purchasing agents look for no immediate change in buying methods, which continue to rely on steel ordered one week to arrive in sufficient time to take care of operating schedules during the next. Weather conditions have had much to do with justifying this policy.

Possibilities of interrupted freight movement must come in for greater consideration from now on, and there may also develop a sufficiently larger demand for some steel products from consumers other than the automotive industries to lessen assurance of prompt shipments to hand-to-mouth buyers. Steel producers do not look for any boom in the market in the near future, but they do look for a slow, steady gain in business.

Putting into operation of a new mill for the production of full-finished automobile sheets by the largest of the Mahoning Valley independents emphasizes once more the adequate equipment of the sheet industry, and, amid half-way normal conditions, recurrence of such neck-of-the-bottle conditions in the supply as prevailed in the summer of 1920 seems utterly out of the range of possibilities.

Youngstown, with its freight rate of 26½ cents to Detroit is not as favorably situated as Cleveland which enjoys a 23½-cent rail and 17-cent water rate or Lorain with a 21½-cent rail rate, but enjoys a differential of 2½ cents over Pittsburgh, and, in point of facilities for prompt shipment into the principal automotive consuming center, enjoys the very best advantages.

Pig Iron—A cycle theorist has figured out that, beginning with December, pig iron prices will gradually advance. This is not quite so important as the fact that some blast furnace interests are holding out for higher prices on first quarter 1925 commitments by making all their present quotations subject to immediate acceptance. Other producers are asking 50 cents more per ton for foundry and malleable for shipment over the remainder of the year.

Aluminum—Quite a little business has been done with consumers who felt that once the political calcium light was taken off aluminum, the market would stiffen in response to the light allotments by European producers to the American market. On the other hand, importers and consumers are of the opinion that one of the real benefits achieved from the campaign that has now come to a close has been the elimination of all possibility of further advances in the rates of import duties on aluminum.

Copper—Sentiment among producers is decidedly bullish, and further fractional advances would not come as a surprise. Domestic buying is fair.

Tin—While the market is still one of daily ups and downs, the metal's statistical position is decidedly favorable to maintenance of prevailing levels with the possibility of further slight advances.

Lead—Slightly easier.

Wilmer Elected to Head Goodyear-Zeppelin Board

AKRON, Nov. 5—E. G. Wilmer was elected president of the board of directors of the Goodyear-Zeppelin Corp. at the first annual meeting here last week. G. W. Stadelman was chosen president; P. W. Litchfield, vice-president; E. A. Lehmann, vice-president; Dr. Karl Arnstine, vice-president; P. H. Hart, treasurer, and C. A. Stillman, secretary.

Dr. Arnstine is expected to arrive in Akron within a few days with 12 Zeppelin designers to start work on the 5,000,000 cubic foot airship, recently announced by Mr. Litchfield and Captain Lehmann. The ship is to be twice as large as the ZR-3, the largest ever designed, and will cost approximately $3,000,000.

Latin-American Outlook Good Except in Brazil

WASHINGTON, Nov. 5—The outlook for sale of automobiles in various Latin-American countries, with the possible exception of Brazil, is pictured as being good, according to cable advices received by the Bureau of Foreign and Domestic Commerce from commercial attachés in South America.

The cables, dated Nov. 1, from the various countries are as follows:

Guatemala—Automobile imports continue to hold up. Thirty new cars were imported during October.

Mexico—During the week business generally was slightly better and the outlook is more optimistic. Automobile trade continues active.

Venezuela—Importation of automobiles is steady. Truck use is rapidly increasing, competing with La Guayra-Caracas Railway.

Bolivia—The market for American automobiles, tractors and other agricultural implements is improving. Conditions in Oruro and La Paz and other centers are more satisfactory from an economical standpoint.

Chile—Chilean industries continue active, but trade, both wholesale and retail, is below normal, excepting in automotive lines.

Peru—Automobile sales continue satisfactory. Exchange is improving.

Brazil—There is a slump in the Rio de Janeiro automobile market, while the demand in Sao Paulo continues good, due partly to the impetus given by the successful automobile show.

Toledo Manufacturers Increasing Operations

TOLEDO, Nov. 3—Local automotive plants are getting back rapidly into normal production. The Chevrolet Motor Co. plant here has announced that it will take back about 1500 to 1800 men Wednesday, opening the plant after several weeks of idleness for inventory.

The Electric Auto-Lite Co. has been rebuilding its force and production is increasing.

The Willys-Overland Co. plant will close on Nov. 15 for a few days for the purpose of taking inventory.

Plan to Sell Marathon to Operating Company

AKRON, Nov. 5—Negotiations for the sale of the Marathon Tire & Rubber Co. plant to an operating company are now under way, according to Stanley Denlinger of the firm of Burch, Bacon & Denlinger.

All physical assets of the company passed into the hands of Frank D. Burch, trustee, Oct. 30, when Judge Paul Jones at Cleveland ratified the sale of the property to Mr. Burch as trustee.

Marathon went into receivership last January.

French Show in 1925 Hanging in Balance

May Not Be Held Due to Complications in Getting Suitable Exhibition Hall

PARIS, Oct. 27 (*by mail*)—By reason of their failure to get together and decide in favor of a 1925 show, French automobile manufacturers are in danger of being deprived of an exhibition next year. The only hall of sufficient size for the French automobile show is the Grand Palais, a Government building which several months ago was ceded to the Fine Arts Department for an exhibition which will open early next year and close in October.

The French automobile industry raised no objection when this building was given over to the Fine Arts Department, but their recent show having been a complete financial success, they are really alarmed at the prospect of not being able to hold another until 1926.

The intention is to build brick and concrete buildings inside the Grand Palais and to demolish these will occupy at least two months, so that the automobile show could not be held until the end of the year or early January. This would make it the last of the European automobile shows, which is a condition the French trade refuses to accept.

Every effort is being made to get over the difficulty either by inducing the Fine Arts Department to close on an earlier date, or to erect a special temporary building in some other part of the city. The proposal to hold the show in a provincial city meets with little support. Henry Cezanne, general show manager, says that the trade will do its best to make a show possible, but the situation is a difficult one.

Tudor Chosen Trustee by Haynes Creditors

INDIANAPOLIS, Nov. 3—Robert L. Tudor of Kokomo was elected trustee of the Haynes Automobile Co. at a meeting of creditors and their attorneys, held in Federal Court quarters here today. Bond was fixed at $50,000. It is the duty of the trustee to assume charge of the estate of the Haynes company, which was adjudged a bankrupt recently.

In the court order Harry C. Sheridan, Federal referee in bankruptcy, instructed the trustee to take possession of all Haynes property and authorized him to operate the service department, which, representatives of the creditors say, is one of the most valuable assets. This department is to be operated on a cash basis, and eventually this and all other property will be liquidated and the money pro rated among the creditors.

Mr. Tudor is interested in a poultry packing business, and he also operates a number of filling stations located in Kokomo.

Calendar

SHOWS

Nov. 9-15—New York, Annual Automobile Salon, Commodore Hotel.

Nov. 9-19—Buenos Aires, Annual Automobile Show, Pabellon de las Rosas, under the auspices of the Automovil Club Argentino.

Nov. 10-15—Chicago, Annual Show and Convention of the Automotive Equipment Association, Coliseum.

Dec. 1-13—Montevideo, Uruguay—Second Annual Motor Show, under the auspices of the Centro Automovilista del Uruguay, held in buildings of the Associacion Rural del Uruguay.

Dec. 5-14—Berlin Automobile Show.

Jan. 2-10—New York, National Automobile Show, under the auspices of the National Automobile Chamber of Commerce, Bronx Armory. Open to the public except on Jan. 2 and 3 which are trade days.

Jan. 23-31—Chicago, National Automobile Show, under the auspices of the National Automobile Chamber of Commerce, Coliseum and First Regiment Armory. Open to the public except on Jan. 23 and 24 which are trade days.

Jan. 25-31—Chicago, Annual Automobile Salon.

RACES

Nov. 24—Los Angeles.

CONVENTIONS

Nov. 6-8—Chicago, First Convention of the National Standard Parts Association, Hotel La Salle.

Nov. 10-15—Chicago, Annual Convention and Show of the Automotive Equipment Association, Coliseum.

Nov. 16-22—Chicago, Transportation Show, under the auspices of the Motor Truck Industries, American Exposition Palace.

Nov. 18-19—Joint Service Meeting of the S. A. E. with the N. A. C. C. Cleveland, Hotel Winton.

Nov. 18-20—Akron, Ohio, Annual Convention of the National Tire Dealers Association.

Nov. 19—Annual Meeting, Motor Truck Industries, Inc., Detroit.

Jan. 5—New York, Convention under the auspices of the National Automobile Dealers Association, Hotel Commodore.

Jan. 5-9—Chicago, Road Show and Convention of the American Road Builders Association.

Jan. 26-29—Chicago, Eighth Annual Convention of the National Automobile Dealers Association, Hotel LaSalle.

S. A. E. MEETINGS

Nov. 13—Indiana Section, The Flow of Heat from Piston Barrels to the Cylinder Walls, H. A. Huebotter, research engineer of the Engineering Experimental Station, Purdue University, Hotel Severn, Indianapolis.

Nov. 14—Washington Section, Air Cleaners in Motor Performance, L. I. Dollinger, Staynew Filter Corp.

Dec. 11—Indiana Section, Aviation Development, Major E. L. Hoffman; Superchargers, Dr. F. A. Moss.

Dec. 15—Cleveland Section, Development of Clutches, Ernest C. Wemp, Long Manufacturing Co., Old Colony Club, Hotel Cleveland.

Jan. 15—Indiana Section, Lubrication and Crank Case Dilution, W. S. Sparrow of the U. S. Bureau of Standards.

Jan. 19—Cleveland Section, Preparation of Fuel Charges and Detonation, Arthur H. Denison, Weger Motor Co., Old Colony Club, Hotel Cleveland.

Jan. 20-23—S. A. E. Annual Meeting, Detroit.

Feb.—Indiana Section, Automobile Finishes.

Feb. 16—Cleveland Section, Electrical Instruments and Measuring of Chassis Tests by Means of Them, J. H. Hunt, General Motors Research Corp., Old Colony Club, Hotel Cleveland.

Mar.—Indiana Section, Developments in Transmission.

Mar. 16—Cleveland Section, Road and Riding Ability, Harry Horning, Waukesha Motor Co., Old Colony Club, Hotel Cleveland.

Apr. 9—Indiana Section, Talk by F. E. Hunt, vice-president of the General Motors Research Corp.

Ford Launches Plan for Ocean Shipping

(*Continued from page* 829)

turn loads of the boats cannot be governed exactly, and therefore these may be delivered at any of the ports contiguous to the regular shipping ports. For instance, return loads may be carried to New York, the boats then proceeding to the regular loading ports to pick up its outgoing shipment.

Under present plans the boats on their outbound trips will carry only Ford products. The Onondaga on its trip to Buenos Aires will carry knock-down parts for 2100 complete cars and will also carry enough parts for one month's service requirements. Thus by making one round trip a month one boat would carry approximately enough cars and parts for the requirements of that particular branch.

Its return load will so far as possible originate in Buenos Aires. If a full load is not picked up there it may stop at Montevideo to pick up the remainder, the Ford Montevideo branch making whatever arrangements are necessary. It is not planned to stop at any of the Brazil ports at the present time because of congested conditions, though stops may be arranged there later. Shipments to the Montevideo and Sao Paulo plants on the Atlantic, and to Santiago, Chile, on the Pacific, will continue via present service.

The Oneida will carry similar cargoes of parts to assembly and sales branches located adjacent to the Atlantic which can be reached more cheaply than by all-rail routings. This boat will be entirely in the coastwise service, the company carrying on its steamer operation experiment in both coastwise and foreign shipping at the same time.

The loading of the boats out of River Rouge and their routing through the Welland Canal and via the St. Lawrence is only incidental to getting them out of the Great Lakes and into the Atlantic. Both boats have been in service on the lakes during the present season, and it is partly because the lake shipping season is now ending that the ocean-going experiment is being made. Their transfer to the ocean, however, is not an expedient to keep them employed during the closed lake season. If successful in their new work they will never see the lakes again unless replaced by larger ocean carriers.

Capacity of the boats is for 4000 tons. The load of 2100 cars and a month's supply of parts represents capacity in terms of finished automobiles and parts. Passing through the canal and St. Lawrence they will be loaded only to one-half their capacity, the other part of their cargoes being carried by barge to Montreal, where it will be taken aboard.

FRANKLIN CLOSED CAR OUTPUT

SYRACUSE, N. Y., Nov. 3—For the first 10 months of this year, 88.5 per cent of the product of the Franklin Automobile Co. has been closed cars. Sedans represent 62 per cent.

H.C.S. CAB LISTS AT $1,880

INDIANAPOLIS, Nov. 3—The H.C.S. Cab Manufacturing Co. announces the list of the new H.C.S. taxicab as $1,880, f.o.b. factory. It is planned to market the product through automobile dealers and also by special taxicab selling companies in the larger cities.

Tractor "Come Back" Staged in Illinois

MANITO, ILL., Nov. 3—Tractor demonstrations have "come back" in central Illinois. A thousand farmers attended an exhibition of power farming upon the Worner farm, south of here. Case, Hart-Parr, McCormick-Deering, Fordson and Twin City machines participated.

Dealers in tractors were well satisfied with attendance and the interest displayed, and rounded up a large number of prospects who are counted upon to invest during the coming winter. With a bumper crop of corn and mounting prices for their grain and live stock, farmers are feeling more optimistic and more inclined to spend money for tractors and automobiles than was the case in the three preceding years and until the deflation following the World War put such a crimp in the farmer's income.

For several years any effort to secure the attention of the average farmer in a tractor, agricultural implement or an automobile, was just so much time wasted. The fact was made plain that there was no money with which to invest, and that the old machinery and the old car would have to answer for an indefinite period. This condition is now happily but a memory, and the farmers' "strike" appears to have been called off. They are commencing to take notes of tractor performance.

This is a healthy sign, and the coming fall and winter should be prosperous for all those engaged in the automotive business where agricultural conditions are as favorable as in central Illinois. Dealers believe that it is now worth while to stage tractor demonstrations,